



HIGH-PERFORMANCE COMPUTING

AUGUST 2005

DIGITAL

Digital home invasion

Network your home for PC-based entertainment

7 CDs' worth of software on**DVD ROM****DVD Toolkit****FULL VERSIONS****Easy DVD/CD Burner**

Simple to use, full featured disc burning.

Alcohol 52%

Create virtual drives to run CDs and DVDs from ISO files.

Not outdated

As sold for \$46.37**Playable demo****Brothers in Arms:****Road to Hill 30**

Play two full missions of this gritty World War II shooter.

OpenOffice.org**2.0 preview**

Full Windows and Linux alternative to Microsoft Office.

DVD ROMIf you don't have a DVD drive, we can mail you a CD of selected programs from this DVD (see Contents, page 8). Details at www.apcmag.com/cdmall.

Use of this disc and its content is subject to the disclaimer on the back of this case and on the DVD, and any applicable third party licence terms.

Full 2.56GB distro**Fedora Core 4**

for i386

The newest release of this leading Linux distro. The perfect companion to the **apc** Mastering Linux series.**Revolutionise your Web surfing****Tabbed browsing for Internet Explorer**

Finally! Add multiple windows to IE with Microsoft's new toolbar.

B-Free Accounting
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As sold for \$78.95

Manage business accounts online. Online registration required before Oct 14 2005.

Steganos Security Suite 6**As sold for \$78.95**

Keep your sensitive data safe. Online registration required before Oct 31 2005.

FileSphere Personal 2005**As sold for \$149**

The ultimate file-management app. Online registration required before Oct 14 2005.

INVESTIGATION

DISC ROT

Why data recorded onto optical media can still disappear.



FAST 17in FLAT SCREENS

Dump the CRT — Seven of the best 8ms LCD monitors tested.

BEYOND MULTICORE

Inside the world's biggest CPU labs.

PALM'S LifeDrive

The PDA gets a 4GB hard drive.



WORKSHOPS

New Mastering Networking series.

- > Set up an IIS server on XP.
- > Edit MP3 tags with Visual Basic.

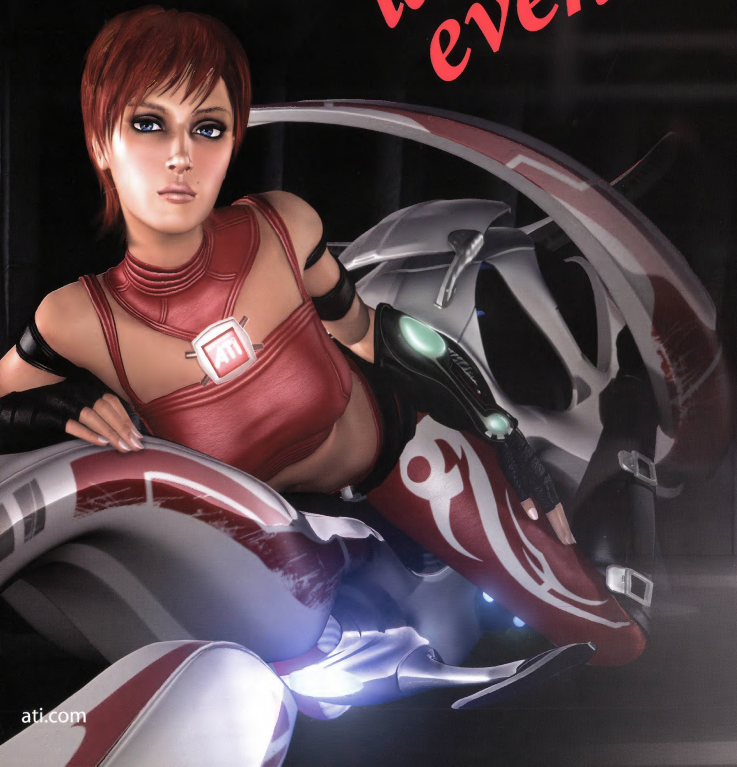
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ATI TECHNOLOGIES

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event*



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-  **Open invite :**
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- SignalUp high-performance wireless
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- 1-year pick-up and return service**

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*Source: RMIT Test Labs, August 2004.

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1

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2

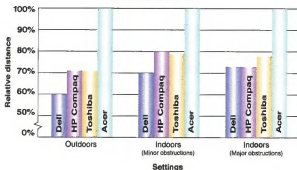
90-day Money Back Guarantee: Acer storage solutions come with a 90-day Money Back Guarantee: your assurance of quality, reliability and functionality.

3

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Performance Comparison of Wireless performance
of notebooks based on Intel® Centrino™
mobile technology report

RMIT IT Test Lab, 11 August 2004





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Acer recommends Microsoft® Windows® XP Professional.

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- SignalUp high-performance wireless
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- Intel® Pentium® 4 Processor (3GHz, 1MB L2 cache, 800MHz FSB)
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- Optical mouse
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- Integrated 10/100M LAN (Broadband-Ready*)
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HP recommends Microsoft® Windows® XP Professional.

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- Intel® Pentium® 4 Processor with HT Technology†
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- 40GB Hard Drive
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- 1MB L2 cache, 2.80GHz, 800MHz FSB

HP COMPAQ BUSINESS DESKTOP dx6120

\$1,399 Lease for as low as
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- Intel® Pentium® 4 Processor 540 with HT Technology†
- Microsoft® Windows® XP Professional
- FREE Microsoft® Office Basic - Includes Microsoft® Outlook, Word and Excel until 31 July 2005
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- 80GB Serial ATA Hard Drive
- ATI RN300SE 128MB PCIE VLI Graphics Card
- 3 year Limited Warranty
- Part Number PV036PA
- 1MB L2 cache, 3.20GHz, 800MHz FSB

Enhance your viewing with special prices for this month on HP's range of Monitors with the above featured desktops.



15" TFT Monitor for \$299
P9617D#ABG



17" TFT Monitor for \$399
P9621D#ABG



19" TFT Monitor for \$499
P9602#ABG

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**HP COMPAQ nx6120
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\$1,995 Lease for as low as
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- Intel® Centrino™ Mobile Technology
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- Microsoft® Windows® XP Professional
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- 15" XGA (1024x768) display
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- * Processor Speed 1.60GHz, 533MHz FSB

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- Mobile Intel® 915GM Express Chipset
- Intel® Pro 802.11b/g wireless LAN
- Microsoft® Windows® XP Professional
- FREE Microsoft® Office Basic - Includes Microsoft® Outlook, Word and Excel until 31 July 2005
- 512MB Memory
- 15" XGA (1024 x 768) display
- Integrated DVD +/- RW Drive
- 60GB Hard Drive
- Integrated Bluetooth
- Part Number PV134PA
- * Processor Speed 1.60GHz, 533MHz FSB

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NOTEBOOK PC**

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\$21.37 per week*

- Intel® Centrino™ Mobile Technology
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- Mobile Intel® 915PM Express Chipset
- Intel® Pro 802.11a/b/g wireless LAN
- Microsoft® Windows® XP Professional
- FREE Microsoft® Office Basic - Includes Microsoft® Outlook, Word and Excel until 31 July 2005
- 512MB Memory
- 15.4" WXGA (1280 x 800) display
- Removable Multibay II DVD +/- RW Drive
- 60GB 5400rpm Hard Drive
- Integrated Bluetooth
- 64MB dedicated ATI Mobility Radeon X600 graphics
- Part Number PV202PA
- * Processor Speed 1.73GHz, 533MHz FSB

**HP COMPAQ nx8220
NOTEBOOK PC**

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\$25.65 per week*

- Intel® Centrino™ Mobile Technology
- Intel® Pentium® M Processor 750†
- Mobile Intel® 915GM Express Chipset
- Intel® Pro 802.11a/b/g wireless LAN
- Microsoft® Windows® XP Professional
- FREE Microsoft® Office Basic - Includes Microsoft® Outlook, Word and Excel until 31 July 2005
- Removable Multibay II DVD +/- RW drive
- 15.4" WSXGA+ (1680x1050) display with wide viewing angle
- 512MB Memory, Integrated Bluetooth
- 80GB 5400rpm Hard Drive
- 64MB dedicated ATI Mobility Radeon X600 graphics
- Part Number PV203PA
- * Processor Speed 1.86GHz, 533MHz FSB

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This month's cover stories

Digital home invasion

What's the point in having all the latest gadgets if they can't make your life easier? Nick Race has a close encounter of the digital kind.



Disc rot

80

You've religiously backed up your data to disc. But at the moment of truth, you discover the information is completely unreadable. Jeanne-Vida Douglas investigates this alarming phenomenon.

8ms 17in LCD panels

56

Space-saving and easy on the eyes, LCD screens are suitable for all environments. Tim Dean looks at seven options.

Beyond multicore

84

Today's CPUs have almost hit the performance wall. Simon Sharwood peeks in the labs of the world's biggest chipmakers to see what's next.

PalmOne LifeDrive

38

PalmOne revolutionises the handheld market with an excellent new product.

ENUM: DNS for your phone

90

David Braue reports on a new technology that could be as important as the DNS (Domain Name Server) system.

Interview: Vint Cerf

92

"Father of the Internet" Vint Cerf talks to Dan Warne about how home routers are breaking the Net, ISPs are ripping people off, and P2P will be less anonymous in the future.

How it's done: P2P technology

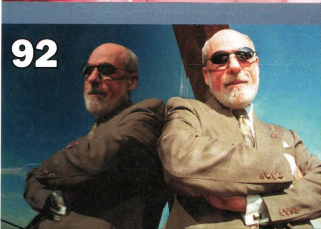
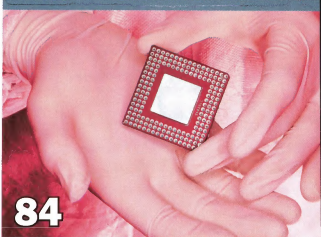
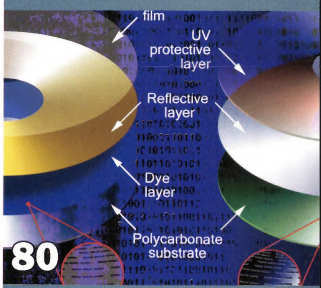
96

Peter Sbarski explains how second generation P2P technologies work.

Workshops

98

The first instalment in a new Mastering Networking series; set up an IIS server in Windows XP; edit MP3 tags using Visual Basic; and more.



On Test



Reviews



System	Dell Precision 380
	PalmOne LifeDrive
	Ipex AllStation X
CPU	AMD Opteron 875
Hardware	Canon PIXMA IP90
	Brother HL-2070N
	Ricoh Aficio CL4000DN
	Maxtor Shared Storage Drive
	ECS PF88 Extreme Hybrid and A9S expansion card
OS	Mac OS X 10.4 Tiger Server
	Windows XP Professional x64 Edition
Software	GetData Recovery My Files 3.4
	FileSphere Professional 2005
	Mandriva Linux Limited Edition 2005
Best buys	All the top products in their fields



apc Labs Challenges

Hardware	8ms 17in LCD panels
System	Media centre PCs

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Need to Know

Technotes	Microsoft's anti-piracy offer
	Is your chat being logged?
	Wireless security cracked
	Dell's price attack
Exchange	Guy Riddle
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Opinion	Matt Kelsh
	Mary Jo Foley
Watchdog	Customer service issues
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WORKSHOP

Networking	IIS server
	Mastering networking, part 1
Windows XP	Settings backup
Photoshop	Web buttons
Programming	MP3 tagging
	VBA scripting
Database	ExportXML
Linux	Mastering Linux, part 9

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Down time

Gear	iPod accessories
	Bluetooth gear
	Mini media centre
	Atari Flashback 2
	Logitech gaming mouse
	StealthSwitch software
	and more...
Books	Computer Networking Illuminated
	Degunking eBay
	Introduction to Programming with Visual Basic .NET
	Beginning JavaServer Pages
	and more...
Games	Guild Wars
	TrackMania Sunrise
	Pariah

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Check out page 33

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Fedora Core 4 — for i386

Fedora is one of the world's leading Linux distributions, and one of the easiest to use. It offers the latest features before they make it into commercial Linux flavours like Red Hat, and enables you to become part of a wide community of open source coders. We've managed the Herculean task of squeezing the entire distro on this month's cover disc.



Full 2.56GB distro

DVD Toolkit

Complete enthusiast's package for authoring, burning, converting, diagnosing, emulating, playing and tweaking DVDs and DVD drives. Includes...

Alcohol 52%

Alcohol 52% saves the hassle of using physical DVD and CDs to install and run programs. Normally selling for \$46.37, the full version is available free on this month's APC DVD.

Not updateable.



Easy DVD/CD Burner 2.0.1

Easy DVD/CD Burner provides all the basic tools you need to create high-quality data DVDs and CDs. Worth \$27, it's yours free with this month's APC.



Full DVD index



This logo indicates a free, complete and unrestricted software package, available only on APC's cover DVD.



When you see this icon in APC, it means there's bonus software on the cover disc.

Need help?

- While we've taken all care in selecting the software and testing the DVD, APC cannot accept responsibility or liability.
- APC does not provide technical support for programs included on the DVD.
- Technical problems? Email: dvd@apcmag.com

- Ad-Aware SE Personal Edition 1.06
- Adobe Encore DVD 1.5
- Adobe Reader 7
- Alcohol 120% 1.9.5
- Alcohol 52% 1.9.5
- ATI Catalyst Display Drivers 5.5
- AutoGK 1.95
- Autoplay Repair 1.0.2
- AVG Anti-Virus Free Edition 7.323
- Bart's PE Builder 3.1.3
- B-Free for Small Business (GST) 4.0.1
- BigFix Consumer Edition v1.76.0
- Blaze DVD 3.5 (Standard)
- Brothers in Arms: Road to Hill 30 demo
- BurnCDCC 1.05a
- Buzzsaw v2.0.0.2
- CDBurnerXP Pro 3.0
- CDBurnerXP Pro 3.0.116
- cdwerty 1.08
- CloneCD 5.2.3.2
- Code from New Web Styles Workshop
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- Daemon Tools 3.47
- DeepBurner Free 1.5
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- DVD Genie 4.10
- DVD Identifier 3.6.3.1
- DVD Idle 5.89
- DVD Info X 1.0.2
- DVD Region X 1.1.2
- DVD Shrink 3.2
- dvdauthor 0.6.11
- DVD-lab Pro 1.53
- DVDStyler 1.4
- Easy DVD/CD Burner 2.0.1
- Easy DVD/CD Burner 3.0
- FileSphere Personal 2005
- Filzip 3.0.2
- Finished Access database from Workshop
- Finished Access database from Workshop
- HD Tune 2.10
- hKSV 2.0.1
- Intervideo WinDVD Creator Platinum 2.0
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- Stumblor Rel. 94
- Linux Kernel 2.6.11.11
- Macromedia Flash Player 7
- Memtest86 3.2
- Microsoft .NET Framework 1.1
- Microsoft DirectX 9.0c
- Microsoft Internet Explorer 6 (SP1)
- MiniStumblor 0.4.0
- Mozilla Firefox 1.0.4
- MSN Tabbed Search Toolbar 1.2
- Nero CD-DVD Speed 3.80
- Nero InfoTool 3.01
- NetStumblor 0.4.0
- Nvidia ForceWare 71.89
- OpenOffice.org 1.9.1m104
- Opera 7.54u2 for Mac OS X
- Opera 8.0 for Linux i386
- Opera 8.0 for Windows
- Outlook Maps code from Workshop

Tabbed browsing for Internet Explorer



Microsoft has finally released this add-on for Internet Explorer which gives the program tabbed browsing — just like that popular feature of Mozilla Firefox. The MSN Search Toolbar also provides users with an instant hard drive search function.

Steganos Security Suite 6

Hide and encrypt personal data and passwords. This package was sold for \$78.95, but it's yours free.

Free online registration required by 31 December, 2005.



FileSphere Personal 2005

Organise and retrieve documents, emails, MP3s and images. This essential office utility is free for APC readers this month.

Free registration required before 13 October, 2005.



B-Free for Small Business (GST) 4.01 Three-month trial

Prepare small business GST and BAS returns by directly importing and organising your Internet banking data. This month, APC has an exclusive three-month trial and a special \$99 first-year renewal price (normally \$299).

Free online registration required by 14 October, 2005.



ShowShifter 2.05

Turn your PC into a home entertainment centre. Previously sold for US\$49.99, it's free with this month's APC.



2.0 preview

OpenOffice.org

Full Windows and Linux alternative to Microsoft Office. This beta version of OpenOffice.org includes PDF exports, table wizards and improved spreadsheets.

Brothers in Arms: Road to Hill 30

Play two full missions in this gritty World War II shooter. The game puts you in the shoes of Sergeant Matt Baker, a D-Day paratrooper squad leader, where you need to balance the squad's lives with the success of the mission.



- PlexTools Professional XL 3.02
- PowerDVD 6
- Protection ID 5.0c
- RealNetworks RealPlayer 10
- Restoration 2.514
- rpcmgr 1.1
- ShowShifter 2.05
- ShowShifter 3.12
- Source code from Workshop
- Spybot — Search & Destroy 1.4
- Steganos Security Suite 6
- Steganos Security Suite 7
- Sun Java 2 Runtime Environment
- TweakNow RegCleaner Standard 2.0.9
- Ulead DVD Workshop 2.0
- Video of Workshop
- Virtual CloneDrive 5.1.1.1
- Virtual Drive 9.0
- VLC Media Player 0.8.1 — for Linux
- VLC Media Player 0.8.1 — for Windows

- VLC Media Player 0.8.1 — for Mac
- Wi-FiFoU 0.3.3
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- YuBumper 0.70
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Workshop PDFs

- Mastering Linux, part 9
- Mastering Linux, part 8
- Mastering Linux, part 7
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Script for success

Open source. For me, as editor, it's an exciting ideal to champion. And a source (sorry) of amazing frustration.

Open source software is starting to have an impact on Australians, and for the better. The CEO of a wireless telco/ISP recently told me the company had successfully replaced its entire suite of Microsoft products with a Linux operating system and applications. This wholesale infrastructure shift resulted in significantly cheaper operating costs, with the savings then passed on to consumers.

Many of APC's enthusiast readers also tell us they get tremendous enjoyment out of installing Linux distros and creating powerful computing environments without a Windows OS in sight.

So the opportunities for open source to win over the computing mainstream are endless. And that's where its developers shoot themselves in the foot, with an assumption that all users are fellow developers or uber-geeks who'll put up with any number of bizarre quirks.

Take the latest distribution of Fedora Core,

Version 4, on this month's cover DVD. Fedora is both user-friendly and enormously powerful, used as the basis of our Mastering Linux series. However, version 3, distributed on the APC DVD in January, had a dodgy media check script.

When the first installation disc was inserted into a CD drive, the media check would pop up and check its integrity. On many PCs, it would report a media failure. As it turned out, the install discs were fine — it was the media check itself that was flawed.

Unfortunately, the bug hasn't been fixed in Fedora Core 4. The install files work brilliantly, but the media check still reports a problem on many computers when there isn't one. A workaround is included on the cover DVD, but you have to wonder why the Fedora developers didn't think the issue was worth fixing.

Here is my suggestion to open source developers: take usability seriously and don't assume that all your users are IT professionals who'll put up with undocumented problems you consider too trivial to fix.

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Need to Know

News, views and analysis from the IT world

Dob in a pirate, claim a freebie

Got any pirated Microsoft products lurking on your PC? You can get a legit copy free — on one condition. *Ian Grayson reports.*

Microsoft is offering to replace pirated copies of its software with the genuine article — as long as you're prepared to finger the source.

Software piracy is a massive problem, with a recent survey by the Business Software Alliance claiming annual losses to vendors at around \$545 million in Australia alone.

Microsoft Australia's licence compliance manager, Suzanne Caldwell, said the scheme doesn't apply to people who have bootlegged their own copy from a friend. Rather, it's designed to help people "who have unknowingly purchased counterfeit product". The program covers the company's entire product range, not just Windows.

For customers keen to find out if their Windows software is genuine or whether they

qualify for a free replacement, Microsoft has created a wizard on its Web site (www.microsoft.com/australia/howtotell).

The wizard shows users how to locate their Windows Product Key sticker

and identify a range of security measures built into it. Further help is available from a hotline on 1800 639 963.

If you have further questions, or want to check the status of other software products, you can download a two-page product ID application from the site. Details of when and where the software was purchased must be included, together with any invoices or receipts. Failure to provide this information reduces the chances of receiving a replacement copy. ▶

Some believe Microsoft's offer could backfire

Is your chat being logged?

Microsoft has released a new corporate instant messaging server which allows all staff conversations to be surreptitiously logged to disk.

The company said it expects instant messaging to overtake email as a form of communication by 2008. The problem for big companies is that such chat isn't logged anywhere. So if a stockbroker's client uses the service to give instructions to buy a batch of shares, and then claims later that they did no such thing, there's no audit trail.

Microsoft believe that its Live Communication Server 2005 is the

answer. It logs everything as well as allowing companies to set up encrypted links so that the origin of messages is certified and their contents kept private.

While undoubtedly an advance in terms of security and accountability, this will be a blow to staff who use instant messaging like telephones for a mix of business and personal communication.

Dan Warne



Tainted booty? Microsoft may let you off the hook if you finger the source of pirated software.

Also in Need to Know:

16 Dude, where's my data?

APC asks Guy Riddle of CBL Data Recovery why so many hard drives are failing, what you can do if it happens to you, and how much it's likely to cost.

20 Feature 64-bit Windows

Clyde Rodriguez, Microsoft's group program manager for Windows, talks to *Dan Warne* about 64-bit computing, Longhorn and more.

22 Opinion

Matt Kesh of AppleTalk Australia can't believe the company is suing its most ardent fans. *Mary Jo Foley* believes Redmond's critics are too harsh in describing delays to Longhorn as a "train wreck".

24 Watchdog

A reader experiences a host of problems with his new PowerBook and can't get satisfaction from Apple, while others have issues with Windows Server and McAfee VirusScan. APC goes in to bat on behalf of its readers.

26 Epinions

From the real cost of home photo printing to dud optical discs, APC readers have their say.

Is it legal...

... to produce "fan movies"

Reproduction of a "work" breaches Australian copyright law if it's substantially similar to the original. However, a fan movie with its own script and actors would arguably create a film which is original in its own right and thus doesn't infringe copyright. But they could run into trouble if their entire title is a trademark, or is deceptively similar to one.

Producers of a movie also retain "moral rights" ensuring their effort is not derogatively treated and receives proper attribution. Fans should ensure they acknowledge the original movie in their credits.

Alan Crawford is a lawyer with Henry Davis York.

alan_crawford@hdy.com.au

Disclaimer: this does not constitute legal advice.



New CPUs to run two operating systems at once

PC users who just can't decide whether to install Windows or Linux as their preferred operating system soon won't have to make the choice.

Due to hit the market later this year, processor chips with built-in virtualisation capabilities will allow two OSes to run concurrently on one PC.

Intel's Australia and New Zealand technical manager, Graham Tucker, said Itanium chips with virtualisation capabilities will be available by the end of the year, with Xeon versions due in 2006. "We see virtualisation becoming standard in every segment, from servers to desktops, and we're working closely with vendors to make it happen."

AMD strategic marketing manager Steve McDowell confirmed his company would release competing chips in the first half of next year. "It will become a standard feature across our range and I don't expect it to attract a pricing premium."

While the ability to run multiple OSes sounds cool, Tucker doesn't believe that's what most users

will want from the technology. "For corporates, it'll be used for server consolidation," he explained. "You can run two mission-critical apps on a single server, knowing that if one fails, the other will continue."

For consumers, one operating system could be used for gaming while another runs office applications or streaming video. This could prove a boon for activities such as Internet banking, where there is a push to use Linux-based applications to improve security.

The only potential hold-up on the road to virtualisation is the operating systems themselves. Eventually they will be able to run natively on chips sporting the technology, but until then, extra software such as the tools offered by software company VMware will be required.

Ian Grayson



Dob in a pirate, claim a freebie

This means that anyone who bought a PC with a pirated copy of Windows preloaded, and not listed on the sales receipt, is unlikely to get a legit copy, though Microsoft will look at these situations on a case-by-case basis. The form must be sent, accompanied by the pirated discs and purchase documentation such as receipts, to Microsoft's head office in Sydney. Software will be checked and the user notified whether or not it is genuine.

While lauding Microsoft's attack on piracy, there are some in the industry who believe the offer could backfire. Pioneer Computers Australia product manager Jeff Li argued that it may encourage people to actively seek out cheap pirated software in the hope of exchanging it for the legitimate product.

"I think you have to be careful when you make an offer like that," he said. "It might make life even more difficult."

Microsoft declined to reveal how many Australians had so far taken advantage of the amnesty. However, Caldwell said there's no plan to scrap the scheme.

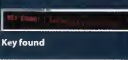
Wireless security cracked in minutes



Scanning for networks



Capturing packets



You have three minutes to switch to WPA.

The FBI recently showed a bemused audience of paranoid security types at an Information Systems Security Association (ISSA) briefing how WEP, the most common method of securing home wireless networks, can be cracked in just three minutes.

Special Agent Geoff Bickers set up a secure WLAN, then a pair of his coworkers used Kismet to attack it using new methods that capture the WEP key's 24-bit unencrypted WEP initialisation vector. They then used brute force

dictionary attacks to decipher the remaining characters.

The agents used void11 to repeatedly disassociate the laptop from the AP, then

Airsnort and Aircrack to analyse encrypted hand-shaking data transmitted as the AP fruitlessly tried to reconnect. After three minutes, WEP had been compromised.

Previously, hackers had to capture around 8GB of data before they could decipher the 128-bit WEP encryption key.

Alarming, around 70% of WLAN access points are estimated to be running without any security at all.

David Braue



Geoff Bickers

In brief news



TWIST IN THE TAIL

As previously reported (APC April, page 20), version 8 of Netscape's browser uses both the IE and Firefox page rendering engines. But the final release has a clever twist: it consults a "white list" and uses the Firefox engine for unknown sites, and IE for those known to be safe.



ONE-CLICK SECURITY

Linksys has said it has the answer to complex wireless security configuration. Its new range of wireless routers include a button on the front which, with one press, communicates with the Linksys software in each PC in the house. It also configures all the wireless settings such as SSID, WPA, etc. The WRT54G (above) is the first to receive the feature.



HYBRID HARD DRIVES UNVEILED

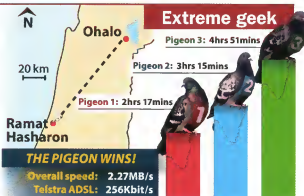
Microsoft and Samsung have demoed a prototype hard drive which is part flash memory, part magnetic media. One gigabyte of flash memory is used to cache data stored on the hard drive so that the drive rarely has to be spun up by the PC. The cache is preserved between reboots, making it more effective than today's hard drive caching.

WiFly faster than ADSL

Three Israeli tech boffins have proved that pigeons are faster than ADSL. Dr Yossi Vardi, Ami Ben-Bassat and Guy Vardi attached 22 memory cards, containing 4GB of data in total, to three homing pigeons and sent them off on a 100km trip. The birds flew the cards in just a few hours, resulting in an overall "WiFly" upload speed of 2.27Mbit/s. This is substantially faster than the ADSL upload speed available in Israel, and indeed that of Telstra's ADSL network (256Kbit/s), proving that WiFly is indeed faster than ADSL.

However, there was substantial variation in performance (see illustration, above). And the enthusiasts were unable to confirm whether the pigeons stopped on any power lines or fence posts en route, which may have affected performance.

The method has been dubbed TCP (transport by carrier pigeon), and is infinitely scalable thanks to natural reproduction. It's also fully self-powered via digestive fuel cells.



Fancy that: WiFly is fast but susceptible to specific malware — birds of prey, shotguns, scorecrows and filitratious pigeons.

An officially ratified IEEE standard — RFC1149, based on wrapping small scrolls of paper around the legs of birds — was released in 1990. The WiFly standard is expected to supersede it.

Dan Warne

HOW GEEKY ARE YOU?

Have you wired up your car? Shared your home media library with five family members in three states? Made a 16 terabyte file server? If you've done something interesting with computing technology, APC wants to hear about it. Email a description of your project to dwarne@apcmag.com and include photos (we need at least one of you pictured with your gear!). The most extreme geek each month wins a very cool prize and everlasting fame in APC.

Data dump

6,150,000,000

Number of DRAM units expected to be sold worldwide for PCs in 2007, up from 1.76 billion units in 2003.

(Source: Korea Times)

39%
Proportion of men who say they use computer games to socialise with friends

Source: GMI Poll

29.5%
Proportion of women who say the same thing

49%
Telstra's market share of broadband users in January 2004 before introducing "\$29.95" deals

(Source: Paul Budde, managing director of telecommunications research and consultancy company BuddeCom, cited in *The Sydney Morning Herald*)

35%
Telstra's market share of broadband users in May 2005 after introducing "\$29.95" deals

1 teraflop
Overall processing power of the Xbox 360

(Source: TechWhack.com)

2.18 teraflops
Overall processing power of PlayStation 3

US\$2 billion
Amount of money per year spyware/adware makers gain from selling ad space
(Source: *The Register*)

\$10,000
Proposed amount companies would be fined for installing software on a PC without permission
(Source: *The Sydney Morning Herald*)

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Cat. 17053-1 \$249



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Cat. 10145-1 \$399



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Cat. 11443-1 \$129



Firewire Hub/Repeater

Have all your firewire devices plugged in at once with this 6 port hub.
Cat. 2847-1 \$85



Serial to Ethernet

Easily web-enable your serial devices. Allows RS232/422/485 devices, including modems to be used over a TCP/IP network.
Cat. 15141-1 \$259



Serial over Bluetooth

This unique unit will allow a serial connection to become wireless using Bluetooth.
Cat. 11920-1 \$459



USB Serial Ports

Provides two serial ports from one USB port.
Cat. 2852-1 \$119



Surveillance Card

A PCI card with four composite video inputs and one output for TV display. Comes with basic security software. A SDK model is available.
Cat. 3429-1 \$299



VGA Splitter/Booster

A powered VGA splitter that can run the second monitor up to 80m from the PC.
Cat. 3445-1 \$199



Removable HD Kit

An aluminium frame and tray to convert any standard IDE HD into a removable backup/storage device.
Cat. 6802-1 \$79



Laser Barcode Scanner

This stylish laser scanner is great for small to medium sized retail outlets. A stand is available.
Cat. 1008039-1 \$399



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Cat. IC485S-1 \$129



KVM with Sound

Allows one keyboard, monitor and mouse to control two PCs. Switches the sound as well as the KVM. Includes 1.2m cables.
Cat. 11669-1 \$89



Cash Drawer

Can be attached to Epson/Star/Citizen/Posiflex parallel receipt printers.
Cat. 8897-1 \$199



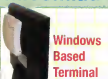
Console Sharer

Allows two workstations to operate the one PC. Supports PS/2 keyboard and mouse with VGA monitor.
Cat. 11667-1 \$139



PCMCIA Serial ports

No serial ports on your new laptop? Easily add two ports with this PCMCIA card.
Cat. 2726-1 \$269



Windows Based Terminal

This tiny WBT can attach to the VESA mounts on a LCD monitor. It supports RDP and emulates SCO, DEC, Wyse etc.
Cat. 1239-1 \$649



Magnetic Card Reader

Reads tracks 1 & 2. Has a keyboard wedge connection for easy installation.
Cat. 8768-1 \$259



Mini 88 key keyboard

Comes with a laptop style touchpad. A great space saving replacement for mouse & keyboard. A cordless model is available.
Cat. 8751-1 \$139

What's New?

2-in-1 Cordless Skype and Normal Phone

Make and receive normal voice calls and calls over the Skype network with this cordless phone. Skype is free VoIP software that allows the user to make free PC to PC calls over an internet connection. www.skypephones.com
Cat. 10172-1 \$220



ATX Power Supply Tester

A quick and simple way to test ATX power supplies.
Cat. 8131-1 \$49



HD Video and Optical Audio Switchbox - 3 In 1 Out

Switch between multiple HD/Optical devices with ease. Connectors include component video, stereo and optical audio. A remote control is included.
Cat. 23032-1 \$119



Dude, where's my data?

When your computer boots and can't find the hard drive, who you gonna call? Not your hard drive manufacturer, evidently.



Exchange



Hip-hop hooray: DJ Fred's scratching technique was never the same after his move to Serial ATA.

What proportion of hard drives is failing?

Of 200 million hard drives manufactured every year, between 2 and 4 million fail shortly after leaving the factory. Manufacturers offer a maximum three-year warranty on drives because they have moving parts that simply wear out. People should treat hard drives as having a limited life.

What sort of problems do you see with drives?

A large proportion of the drives that come in with mechanical failures are around three years old. People often upgrade a motherboard or video card but keep the old hard drive.

Most hard drive platters are made of very thin glass, and sometimes we open a drive that's full of dust because the internal head has literally crashed and smashed the glass.

More often, people haven't used power surge protectors and the drive electronics have been fried. That can be resolved by our specialists, who can swap in the circuit board from a similar model drive.

Then there's user error, where the user has accidentally formatted the drive, or suffered a virus that's attacked the file allocation table.

How much does it cost to have data recovered?

It can vary from \$500 to \$1,000 where data has been wiped. For electrical and physical problems, where we have to take the hard drive apart and reassemble it, the cost can start at \$1,000 and go up to \$2,500. However, it's a "no recovery, no charge" deal.

Are some brands of drive more reliable than others?

No, though IDE drives have a higher failure rate than SCSI drives, which are higher speed and built to a higher engineering specification.

Should the makers take more responsibility for lost data?

Yes. If you go back to the manufacturer, they'll be quite happy to replace your hard drive under warranty, but the moment you ask about recovering lost data, everybody involved absolves themselves of any responsibility. We're talking to system builders and hard drive manufacturers so they can offer data recovery services to customers.

Guy Riddle is manager of CBL Data Recovery, Sydney. He spoke to Dan Warne.

Now who's playing monopoly?

Intel is talking up WiMAX as an alternative to ADSL, but will there be enough spectrum to go round?

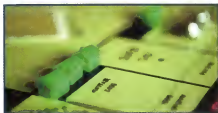
Australia's largest wireless broadband provider announced in May that it was best positioned to service the emerging market for WiMAX broadband, because it had already tied up most of the relevant radio spectrum around the country.

APC's enquiries back up Unwired's claims. According to Intel, WiMAX will work on 2.5GHz, 3.5GHz and 5.8GHz bands. But the Australian Communication Authority (ACA) confirmed that 2.5GHz is reserved for TV stations to beam pictures from outside broadcast vans back to studios, while power restrictions on the 5.8GHz band prevent city-wide WiMAX broadband being transmitted in that spectrum.

That leaves the 3.5GHz band. Unwired has been buying the lion's share around Australia in government spectrum auctions, spending approximately \$110 million to date. However, Unwired refuted suggestions that it plans to

monopolise the WiMAX space. The company said that its access to the majority of WiMAX spectrum simply means it will be the only carrier with enough capacity to offer the "triple play" of bundled voice, data and pay TV over WiMAX, plus fast mobile data services. Other ISPs will only have access to enough spectrum to deliver fast broadband.

Unwired's position has been further strengthened with the announcement that it was in negotiations with Optus for a joint expansion of its network around Australia. The plan on the table is to install Unwired network equipment at Optus infrastructure sites. This would see Optus acquiring access to spectrum



Monopoly money: just \$110 million for near monopoly of the 3.5GHz spectrum? Bargain!

no-one else has, while Unwired can take advantage of Optus's transmission towers.

The upshot is that while Telstra may have a monopoly on Australia's copper phone lines for the delivery of ADSL, Unwired and Optus are positioning themselves for a monopoly on WiMAX wireless broadband.

Simon Sharwood and Dan Warne

Why WiMAX?

Intel's new city-wide wireless broadband standard offers speeds of up to 70Mbit/s and could break Telstra's dominance of the "last mile" connection of broadband into homes. Intel's recently-released "Rosedale" chip makes WiMAX a real

broadband alternative. By 2007, Intel plans to build WiMAX into Centrino to coincide with a WiMAX upgrade that will also permit mobile connections.

Also this month: wireless broadband for \$29, Broadband Directory, page 89.

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Online shopping

Is the Trading Post dreamin'?



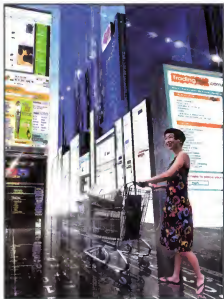
The Telstra-owned Trading Post may become eBay's biggest competitor in Australia if the telco gets its way. The company has taken the first steps towards e-tailing by integrating results from its online Trading Post classified business, acquired in March 2004, into its Sensis search site. The Trading Post site links buyers and sellers of second-hand goods — the same market eBay taps into.

Although reluctant to reveal full details of its future plans, Telstra has confirmed that transactional capabilities are scheduled to be added to the Trading Post site this year, allowing buyers to take payments directly on the site. "We'll see the first stages of a long-term capability by the end of the calendar year," a spokesperson told APC.

Whether the Trading Post site will adopt an auction model is debatable, with recent advertising campaigns for the print publication promoting its speed compared to "lengthy auctions". However, CEO Bruce Akhurst also suggested the transaction model will include a bidding option.

Even getting a commission from fixed price transactions such as the sale of second-hand jousting sticks and kit homes could prove lucrative, and this is likely to be one of the options examined as Telstra considers a possible float of the Sensis business prior to its own full privatisation (expected in 2006).

While eBay has seen off a number of powerful rivals already, including auction



Bugger: Julia was left cursing after once again getting the virtual trolley with the wanky wheel.

sites launched by News Limited, Fairfax and Yahoo, Telstra's ability to reach customers of its telephone, mobile and Internet services make it a formidable opponent.

Long-time eBay users have been arguing that a rival in the market would help control fees. A recent rise in listing fees for the local site saw a number of sellers depart in protest.

Angus Kidman

The biggest range of MFD's gives your office greater flexibility of choice.

There's never been a better time to upgrade your office image communications. Ricoh's new MFD range can be specifically tailored across your business, to maximise productivity and reduce document production costs.

The big range with big features: All seven new generation Aficio models feature the latest in colour control, security and network features as well as offering improved imaging and toner technology.

Productivity: Output speeds from 10 to 55ppm in colour and 24 to 60ppm in black & white. Quicker 1st print speed. Less warm up time. Memory storage up to 320GB.

Control colour: Limit colour printing to those who need it with User Code Access. Option to also monitor and distribute costs to each user group.

Security: Data Encryption and HDD Data Overwrite to prevent data theft; MFD access via standard PC user password, as well as password activated printing for confidential documents.

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So if you're looking for the perfect fit for your office printing needs, look no further than Ricoh. Contact Ricoh on 1800 181 002 or visit ricoh.com.au/smartofficecolour



DREAM SYSTEM: Budget big screen

My old 48cm no-brand TV just wasn't cutting it any more. But paying \$800 for a 68cm telly from an electronics retailer was beyond my budget — or lack of it.

Next stop — eBay. Considering I have a TV tuner card in one of my PCs, I considered an older low resolution projector, but the cost of bulb replacements is just too high.

But then I saw her. Big, beautiful and PC compatible. A 37in (94cm) Mitsubishi



Tres tasteful: the wall-hanging is tops too, Nick.

CRT monitor, ex-call centre, and only \$200.

The 800 x 600 maximum resolution isn't exactly state of the art, but it's perfect "sofa resolution".

It's pretty weighty — at about a tonne, my housemates and I felt like we needed physio on our lower backs after carrying it. Still, nothing

a beer, a movie and a bit of R&R couldn't fix in the long run.

Nick Race is an APC journalist.

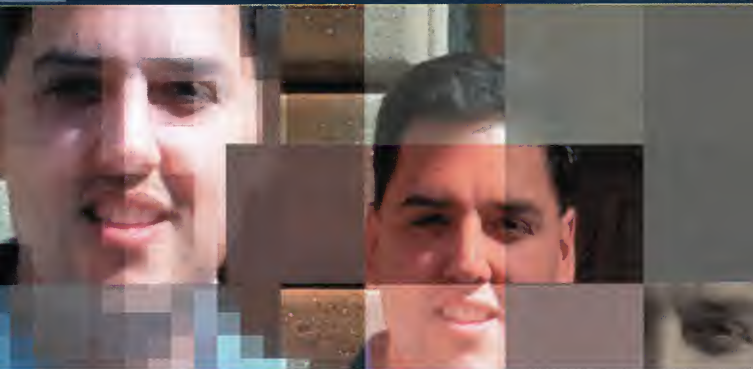
Ricoh. How well do you share?

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Microsoft's 64-bit Windows chief

Clyde Rodriguez,
Microsoft's group
program manager
for Windows, talks to
Dan Warne about
64-bit computing,
Longhorn and beyond.

What do you make of the claim that, with Tiger, Apple is pretty much delivering Longhorn today?

I think that Apple has done some great things with Tiger. In general, the industry has not seen the full capabilities of Longhorn yet, and I know that we will continue to message its value over time. I would take a wait and see approach. We are very aware that the industry needs an injection of some excitement.

Can you share some of these interesting, unexposed features?

We're still very much in the early stages of development. One thing I will say is that the industry isn't yet seeing the full potential of what 64-bit computing allows you to do. In two years, both developers and consumers will look back and say, "That was really the beginning of a new point in computing."

What does 64-bit Windows offer other than greater speed and more memory?

Already with 64-bit Windows, we've eliminated a raft of security threats that affect 32-bit systems and simply don't work on 64-bit Windows. (At an

earlier press briefing, Rodriguez described how Windows x64 simply won't allow any program to patch the Windows kernel — a method often used by viruses and, ironically, antivirus software — to avoid security barriers in Windows.)

Longhorn's system requirements have been a moving target. Can you give APC readers a clearer view?

The reason we can't get a clear picture early on is because we have to get through some of the development work. Then we have to start running through the performance tests so they give us feedback on it.

Okay, but what should APC readers be looking for in a PC today to make sure it will still be good for Longhorn when it comes out?

Without doubt, a machine with a CPU that supports 64-bit extensions is a great investment. Go with at least 512MB of memory, but given RAM is so cheap, I would personally put in 1GB. I think the hard drives machines are shipping with today will be fine for running Longhorn.

Are there any curly system requirements, such as specialised hardware, that you'll need to make the most of Longhorn?

No. One of the features of Windows is that we work with such a vast number of different hardware vendors. If we detect that a system has a particular type of video card that supports specialised processing, the OS will take advantage of that. But as far as being a strict requirement, you're going to find Longhorn's requirements are very generic.

An interesting development recently was the Microsoft/Samsung hybrid flash hard drive that caches a huge amount in flash to save on power usage. Will there be more hard drive devices like that to dovetail with special enhancements in Longhorn?

The hybrid flash hard drive is a great example of how Microsoft works very closely with its hardware vendors. Because of those relationships, we can do things that might not otherwise be possible for a software company.

Power management is something that goes beyond the operating system. Processors and any hardware device you plug into a machine can be power-aware and be able to manage consumption. In Longhorn, we're definitely looking at that deeper and working very closely with our hardware partners.

Microsoft has announced that it will offer an antivirus solution, but it's going to cost customers. Isn't it a bit rich to charge customers to fix problems that exist basically because Windows was flawed to begin with?

That's a very good point. I honestly don't know. If you look at security, there are a number of areas where we've definitely made some major improvements for customers at no cost.

With x64, for example, we've closed off the possibility for a large proportion of viruses to install themselves or run. As far as the antivirus offering, I think that's something that will continue to evolve and I know that, over time, that is something we want to make easier for customers. As far as the cost model goes, I couldn't speak [about] that personally.

I guess if you offered free, comprehensive virus protection, the entire antivirus industry would go out of business.

It's true that with Microsoft's influence within the industry we do have to bear in mind competitive aspects like that.

There are some areas in which Microsoft has done horribly badly with Windows. For example, driver installation — the wizard hardly ever works.

You are going to see great improvements there. I know from talking to the crowd at the Windows Hardware Engineering Conference [WinHEC] that we all want to simplify the process for users to install drivers.

You're right, it's painful in many areas today. But it's gotten better. In the early days of Windows it was disastrous, primarily because drivers were the main cause of blue screens. We've done a lot of work over the past few years to educate vendors on how to write more reliable drivers, and how to make the system more robust against driver failures.

The same thing with uninstallation. APC recently had a letter from a reader complaining that uninstallation often leaves stuff strewn all over your system.

Yes, one of the things we are actually doing with the Windows logo program is putting some additional requirements into it that improve the uninstall process. If they don't meet our requirements, they won't qualify for the Windows-compatible logo. We're definitely working on that with Longhorn as well. We want to help all those users who [end up with] a lot of extra baggage on their system after a while.

The decision to back-port the Avalon user interface of Longhorn to XP is interesting. Isn't that one of the primary reasons for people to buy Longhorn?

One of the things we want to do is help software vendors target their source code to multiple platforms. By moving Avalon to the XP platform, we allow them to take advantage of all its features and still target the largest possible audience of users. Essentially, we make it more compelling for software writers to write for Windows.

Microsoft has typically been the industry stalwart of backward compatibility, which has led to a lot of legacy baggage lying around in Windows code. Is that changing?

Many times, it's a very difficult thing. We focus very heavily on compatibility so people can make the most of their technology investments over time. But there is a breaking point. We want the industry to be able to keep innovating, and sometimes the only way to innovate is to cut compatibility. Apple certainly did that a while back with OS X.

Indeed, Apple's a company that's not afraid to tell its customers: "Sorry, you

can't use this application unless you also pay to upgrade to the very latest OS revision." Microsoft has been the opposite, but is that changing now, with the news that IE7 will only be for XP and above?

I wouldn't call it a significant change in approach — we're still very much focused on compatibility. But there are going to be specific areas where backward compatibility won't be possible.

Blackcomb is to be the next version of Windows, after Longhorn. What else is on the drawing board?

I can tell you that, as a whole, Microsoft is focused on making using a computer a

seamless experience. I hate the fact that people have to worry about drivers or how a software program uninstalls, or that you have to look at a control panel, or configure your computer's use of memory or power.

We want to eliminate the task of managing your PC, so I think you will see big strides in that with Longhorn. In Blackcomb it will become even easier.

People use appliances like a telephone or a microwave today like it's second nature. We want to reduce the learning curve of Windows to that level.

Finally, Microsoft is a company that traditionally doesn't seem to have been very good at doing simple and attractive interfaces. What is it doing to make Longhorn better in this respect?

We've actually had phenomenal people in the area of interface design working on Longhorn. We also have a team dedicated solely on user interface research and it's an area of real-world data-gathering that we're investing more heavily in than ever before.

When I talk about blurring the lines between the user and the computer, the interface is where you start. If you think about the amount of money Microsoft spends on research, user interface research is receiving a great deal of that funding.

But I don't disagree with you — Windows is very complex to use in terms of the various components. But it's something that I think we're going to make major advancements in over the next few years. www.apcmag.com



Taste of the bitter Apple

AppleTalk.com.au co-founder Matt Kesh can't believe Apple is suing its most ardent fans for speculating on unreleased products.

I'm still finding it hard to grasp that Apple is taking legal action against Mac news sites run by fans. These sites give Apple priceless promotion, the sort that money can't buy. There isn't a company in the world that would want to spoil that by turning many of these sites against them. Why would Apple do this?

Apple's fan base has an unquenchable thirst for new products. Enthusiast news sites create a culture of purchasing, owning and upgrading to the latest Apple products — exactly the constant upgrade cycle among Apple's most loyal customers that has kept the company afloat during the bad times.

Apple claims it's suing to protect loosely defined "trade secrets" from being published.

It's true that Mac fan sites have an emphasis on who can break the news on an Apple rumour first. Usually the rumours don't turn into products — Mac fans realise the fun is in the chase — although some of them do. However, it's alleged that Think Secret, one of the sites targeted by Apple's iron-fisted lawyers, had sources inside the company who were leaking details on new products months before release.

From a business perspective, it's understandable that Apple wants to stop this. But the way it has tackled the problem sets a frightening precedent. Instead of pursuing those people who knowingly broke their confidentiality agreements, Apple is instead going after the people who reported the information. In the US, journalists get certain protections against this kind of legal action. Apple hasn't gone after them — it's pursued the fans who run the news sites and have few resources to defend themselves.

If critical information is being leaked so frequently that it becomes a problem, Apple should fix the leaks, not drain the ocean.

Apple claims Think Secret is a blog and therefore shouldn't be afforded journalistic legal protections. It would probably consider my site, AppleTalk Australia, to be a blog too because it's not owned by Packer or Murdoch. However, both sites operate under journalistic principles. I believe journalists are defined by their function of research and reporting, not their union membership.

People like Nick Ciarelli (owner of Think Secret) are responsible for making Apple what it is today. To see Apple trampling him and

others is a travesty. In my opinion, Think Secret did nothing wrong by publishing rumours, clearly marked as such, submitted by anonymous sources. I do it every week.

It's next to impossible to get any hint from authorised spokespeople on what's next in Apple's product roadmap. Which is great for maintaining the company's competitive edge, but bad for end users since there's no indication about when a model will be superseded.

On the odd occasion when insider information becomes public knowledge, Apple should be chuffed that so many people care about what it's doing. Few

people care as much about what's in the next Dell PC, or in an update to Windows.

It's a disgrace that Apple is using the legal system to attack people for reporting the truth about Apple products on their Web sites. For a company focused on innovation, pushing the boundaries and "thinking

different", Apple seems hell bent on manipulating its fans and holding back online journalism.

Matt Kesh is co-founder of AppleTalk Australia (www.appletalk.com.au).

o news site run by Apple users dedicated to reporting the latest information on Apple products in Australia and around the world.

Apple should fix the leaks, not drain the ocean

Lonely Longhorn seeks loving user



Pundits calling Longhorn a train wreck might be going too hard on the 'Softies'.

It's definitely late. Beta 1, due this August, will be only one-third feature-complete — even though the Longhorn operating system has been in development for two or three years.

But based on the latest code drops and PowerPoints, it sounds as if Microsoft is going to be able to make good on its promises of some fairly hefty improvements in what are unglamorously known as "fundamentals." Fundamentals include everything from improved power management to tighter security and streamlined operating system deployment capabilities.

As other Microsoft watchers have noted, if the company does nothing but get these fundamentals right, it will have one heck of a Windows release on its hands. Wouldn't you upgrade to Longhorn if it blue-screened significantly less than your current Windows release? If you could hot-patch without rebooting your system? If system hibernation mode actually worked right and allowed your battery to last close to all day long?

The Windows team is claiming it can and will deliver these benefits by the time Longhorn ships in Q2/Q3 2006. But instead of touting these more mundane improvements, Microsoft continues to focus on the glitzy, razzle-dazzle features, like the Aero "Glass" user interface effects and Windows search

capabilities. And fairly minor, developer-specific Longhorn elements, like the "Avalon" presentation system, "Indigo" communications subsystem and WinFX programming interfaces, get far more press than features that will really change users' experience in terms of reliability and performance.

Microsoft is loath to characterise Longhorn as "Windows XP Service Pack 3", most likely because users tend to equate service packs as minor upgrades consisting primarily of bug fixes. But Microsoft broke the naming convention with Windows XP Service Pack 2 — a wholesale upgrade to Windows XP that, by all accounts, could and even should have been characterised as a brand new version of Windows (Windows XP SE anyone?).

I say it's time for Microsoft to refocus its Longhorn messaging on the fundamentals. With all those millions of marketing dollars it's spending to flog Windows XP, you'd think Microsoft could dedicate a few bucks to touting Longhorn fundamentals as sexy. After all, even if the Redmondians deliver nothing but better security, reliability and performance with Longhorn, Microsoft should have a winner on its hands.



Mary Jo Foley

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Stylish Design

With Cold Blue LED light, it makes your PC system more stylish.



Apple's cooked 'book

After a litany of technical problems, one reader just wants a fresh Apple. But getting one is proving more difficult than expected.

Dear Watchdog,

I purchased an Apple PowerBook for \$4,349.40 in February, 2003. Since halfway through 2003, it hasn't worked properly and Apple refuses to replace it — even after it has been to Apple dealer NextByte for repair five times, and once to Apple's own headquarters in Sydney.

The computer now won't even boot up. Apple has been terribly rude and told me that it's my problem. They have even gone to extremes to tell me that they can't financially afford to replace my computer.

I have a number of documents from third-party dealers stating that faults do indeed exist and many users of the same computer have complained of the same problem (in fact, more than 80 on Apple's own support forums).

The problems that I have experienced are:

- extreme overheating. The unit becomes extremely hot, to the point that it has worried myself and others;
- the battery runs out after just 20 minutes. (Apple has replaced the battery without success);
- DVD-R/CD-Rs can't be successfully burned. I've tried various combinations of brand and speed setting with no luck;
- continuous "popping", "buzzing" and "squealing" sounds from the PowerBook's speakers which made it impossible to use in the classroom as it was a disruption to my students;
- the inability to connect to wireless networks beyond a radius of about 10 metres using either Apple's own AirPort Extreme base station or a D-Link unit.



Hot box: the Powerbook became too hot to handle, had poor battery life and continually made popping sounds.

I have tried to resolve the situation with senior Apple customer service staff on numerous occasions without success. I have been a loyal Apple customer for six years and feel let down. Apple has been a company that I have always supported and endorsed and now that I have a problem with my machine, they don't want to know about it.

Stuart Guthrie
Shoalwater, WA

Watchdog invited Apple to investigate Stuart's complaint. Media relations spokesperson Martha Raupp did not respond to our letter nor repeated follow-up phone calls. When we finally managed to reach her on a mobile number to ask if Apple would be providing a response, she said "no".

In the meantime, Apple emailed Stuart directly and said it wanted time to "carefully consider" his complaint. Head of customer service, Shelley Reid, said the company would commit to respond to him within three business days.

Watchdog contacted Apple's marketing manager, Rob Small, and managing director, Tony King, to question why it had been so difficult for APC to get any acknowledgement or response.

Dear Watchdog,
I won't disclose the details of our negotiations with Mr Guthrie as they are between us. My understanding is that we have come to a resolution that Mr Guthrie is happy with. Thank you for giving us a chance to know that his letter is about to be published.

Rob Small
marketing manager
Apple Computer Australia

Watchdog followed up with Stuart and checked whether the issue had indeed

Out of service

When Richard Leahy updated his client's Windows Server 2003 to SP1 over the Net, he assumed he was doing the right thing given Microsoft's urging to install patches as soon as they are available to mitigate security risks. Everything went fine until his client wanted to install Office XP on the server for occasional use by staff when all desktop PCs were occupied.

During installation, Office XP requested the Windows 2003 SP1 install disc to be inserted. However, the only disc Richard had was for Windows Server 2003 original release, as SP1 had been installed over the Internet using Windows Update.

When Richard inserted the 2003 original release disc, the Office XP installer rejected it, asking him again to insert the SP1 CD.



Update hiccup: after a slight delay, Microsoft has made the Windows Server 2003 SP1 CD available locally.

The dialog box in the Office XP installer didn't give him the opportunity to browse for a downloaded version of Windows Server 2003 SP1 saved on the hard drive.

Richard checked on the Microsoft Web site and found that Microsoft US offered Windows Server 2003 SP1 on CD by mail for customers for US\$5, but this solution wasn't available to Australian customers.

Although Microsoft Australia couldn't reproduce the problem Richard had in its own test environment,

it apologised for the inconvenience he experienced trying to get the Windows Server 2003 Service Pack 1 CD. It said when products were released in the US, they typically arrived in Australia six weeks later. The CD is now available via Microsoft Customer Service on 13 20 58.

Contact us

WE WANT TO KNOW

how IT companies are really treating you. Letters must be under 500 words and include your full contact details and any product information. Write to: watchdog@apcmog.com or PO Box 4088, Sydney NSW 2001. All correspondence becomes the property of APC and is subject to editing.

been fully resolved to his satisfaction, as claimed by Apple.

He was surprised to hear that Apple believed he was "happy" as he was still looking at the faulty computer sitting on his desk. However, Stuart told Watchdog: "Apple may be taking my PowerBook back to Sydney to examine it again. I have

requested this because they are hesitant to replace my unit. They might be worried about negative publicity, although I highly doubt it. They don't seem to care too much about what may or may not happen.

"I'm not looking for a high tech replacement machine, all I want is a reliable unit that works."

Finally, 32 days after Watchdog first contacted Apple regarding Stuart's problem, the company supplied a brand new replacement notebook. Despite this, Stuart said the company claimed that the only thing wrong with his original unit was a faulty hard drive.

How does Apple rate? Have you experienced similar service from the company? Do other

notebook vendors offer the same treatment or better support? Tell us about your experiences. Write to watchdog@apcmog.com.

Apple backs down on iPod policy

Watchdog reported last month (APC July, page 25) that iPod warranty claims could only be made by customers who posted their iPod to Apple. Apple has now modified its policy for iPod servicing, allowing retailers authorised by Apple (Apple Authorised Service Providers) to provide servicing or process warranty claims. The retailers still have to send the iPod back to Apple for service, but are now authorised to inspect iPods for problems and deal with customers directly.

Card sharks

Dear Watchdog,

It seems that McAfee has now resorted to the techniques of unscrupulous Web site operators, automatically rebilling its customers for annual subscriptions.

When [my business] signed up for McAfee VirusScan last year (via phone), we weren't advised of any automatic subscription renewal process whereby our credit card would be automatically debited for the program update 12 months from that date.

However, we received an email from McAfee today advising us that is exactly what has happened — after the charge was deducted from our account. After great difficulty, we discovered the clause that states McAfee will do this 10 conditions deep in the Terms & Conditions section of its Web site.

To make it worse, we're not even sure which credit card it took the money from.

Even finding a contact email address to contact a McAfee representative about this matter has not been straightforward.

We are long-term business users of McAfee's antivirus software. We are given a clear choice in configuring the automatic updating of virus definitions in the program, but sadly we're not given the same clear choice in charges to our credit card.

Shame on you McAfee. If we did this sort of thing with our own customers, we'd very quickly be out of business.

McAfee had better not send a "you're the customer and you're to blame" email back to us, either. It had better have a very close look at its system from the customer's point of view and then fix it up, and give us an apology.

**Brent Williamz
Buderim, Qld**

Dear Watchdog,

McAfee is dedicated to providing the best possible customer user experience. As part of our McAfee Always On Protection program provided to subscribers, we automatically renew the user's subscription to prevent a lapse in coverage and ensure that their systems maintain critical security protection. We are open and up-front about this practice.

Mr Williamz subscribed by phone. When customers subscribe by phone, the procedure is that they are told by the customer service agent about the automatic renewal. In addition, customers are presented with the licence agreement

and asked to read it every time they download any subscription product. If the customer did not want the subscription to be automatically renewed, the EULA instructs the customer to contact us to turn auto-renewal off.

In addition, we send out an email reminder (informing the user of the automatic renewal) at the time of renewal. Consumers who do not wish to receive this feature of the service may opt out at any time or may receive a refund within 30 days of renewal if they wish to cancel their subscription.

Surveys of our customers show the vast majority appreciate this feature. They see it as a valuable benefit of the subscription process, knowing they will always be protected during virus outbreaks.

**Steven Shapiro
product manager
McAfee consumer strategy and
marketing group**

After receiving Shapiro's response, Brent told Watchdog he had never been advised of the auto-rebiling policy on the phone, and reiterated that the only email he received about the automatic rebilling arrived after McAfee had already taken the money. He also argued that McAfee's practice of mentioning the rebilling policy ten clauses deep in the end user licence agreement simply doesn't constitute adequate warning, as few people read EULAs in depth.



Pay to work: vendors burying billing conditions in EULAs can give consumers an unwelcome surprise.

Hidden costs: the truth is out there

The startling facts about the true cost of colour photo printing at home keep on rolling in.

Your article "Digital printing exposed" (APC June, page 18) reveals some truths about printing photos. In my experience, however, the real truth is even worse.

Just over two years ago I purchased a Canon S820 printer with a digital camera. I soon found that I was regularly replacing the ink tanks. I kept a record of the weight of the full and empty ink tanks, measured using digital kitchen scales, and found that the tanks contained 10g of ink. Assuming that the ink has a similar density to water, at \$27 per tank this makes the ink worth \$2,700 per litre!

Averaging things out over several photo prints, I found that an A4 print uses about 1g of ink, worth \$2.70. Canon Photo Paper Pro costs \$27 for 15 A4 sheets — \$1.80 per sheet. That's a total of \$4.50 for each A4 print, equal to \$1.12 for each 6 x 4in print.

Canon Photo Paper Pro paper has a claimed life of up to 25 years. However, one

photograph I placed in a frame and exposed to indirect light had noticeably degraded after just a few months.

Then, after about 15 months of use, the print head in the printer failed. Research showed that this is a typical fault with these printers after around 18 months. A new one costs around \$300 — about 80% of the value of the printer. Fortunately, Canon provided me with a new one as a goodwill gesture.

The small amount of photo printing I now do is through Camera House — much cheaper than using my own printer with genuine inks. Although I haven't put the photos in frames and exposed them to light, I haven't noticed any degradation and don't expect to.

I'm now refilling the ink tanks with bulk aftermarket ink. This proves an extremely cheap way to run the printer, although the colour isn't as accurate. When the print head

No value for money: it seems the reality of home photo printing doesn't match the marketing hype.

Chris Andrews
Eumundi, Qld

REBIRTH YOUR PDA

I read the write-up on HP's "Non-upgradeable upgradeable PDA" (APC June, page 24) with interest, as the same thing happened to me. Like Nathan Keenan, I thought I had no

It's time we pushed back against the greedy music and movie industries who want us to pay over and over again and tell us it's not even legal to back up our music from CDs to our computers and portable MP3 players.

Steve Ariel
Cornubia, Qld

Steve's letter reflects the frustration many of us have experienced with optical media. For his insight, he signs our letter of the month prize, a Logitech LX700 wireless keyboard and mouse set, worth \$199.



Letter of the month: Call to arms over dud discs

In this age of litigation gone mad, why aren't we all lining up to sign on to class actions against "big CD/DVD"?

I would like to submit the case that the design of the CD/DVD is severely flawed — and it could be possible that this is not an accident.

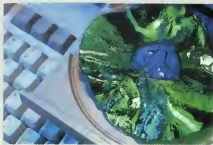
Floppy disks always came in protective sleeves which made them resilient to

damage. But a few years later, CDs were introduced with no housing, no sleeve and no protection. Was this a revolution in technology or a step backwards? When they were introduced, they were promoted as unscratchable and able to last forever.

Of those of us who have experienced the dreaded scratch, how many have been forced to fork out money to purchase a second copy of a CD or DVD we already own? We all know who reaps the benefit from this scratch.

I think it's past time we said "enough", stood up to the CD and DVD manufacturers and demanded our free second, third or fourth copies.

After all, fair-minded software companies will ship you a replacement software install disc at a reasonably low cost if you lose or damage it and can show proof of purchase. That's because you've bought a licence to the software, not the disc itself.



Communication breakdown: no protection from the elements, no protection for consumers.

options. Then I discovered the Familiar Linux project. This breathes more life into the flagging 3600 series PDA than any CE upgrade.

I was so impressed with it, I even blew away (after backing up) the ROM on my HS550 and I am happily using my PDA to link via Bluetooth to my T610 mobile, which in turn uses GPRS to give me instant Internet. I can even use Wi-Fi under Linux. Not to mention flip the screen to landscape in my app!

Granted, it's not straightforward enough for your average "my PDA is only for contacts" consumer, but there are options available if you explore them.

Andrew Frodsham
Bondi, NSW

LIFE'S TOUGH

Microsoft stopping hacked versions of Windows from being updated is very uncool (APC May, page 18). My friend recently swapped his PC for a Macintosh and no longer needs Windows. He's given me his Windows licence but because the OS was pre-installed on his PC, I have to install it on my machine from a copied version of Windows.

It will be a real problem for me if Microsoft's validation scheme finds that my

copy of Windows isn't "genuine". I am a pensioner and can't afford to buy a whole new copy of Windows, especially considering my friend has given me his licence already. Back to Linux I go.

Adam Bennett
Salisbury, Qld

WE NEED EMAIL CUSTOMS

It must be obvious by now that any reactive measures, such as those which form the basis of the Australian Spam Act, are only effective against more or less honest companies or individuals, and useless against the majority of professional spammers from overseas.

I don't believe any antispyware software can ever be as effective as required, and the cost of such software shouldn't be borne by end users. The only solution lies in a mixture of technical and educational approaches. The technology and infrastructure for this, by and large, already exists.

For instance, within a three to five year period, email servers and clients could be developed that only send and accept email which proves the credentials of the sender by bearing a digital signature issued by a trusted certification authority. Software

Agenda: Your place to vent

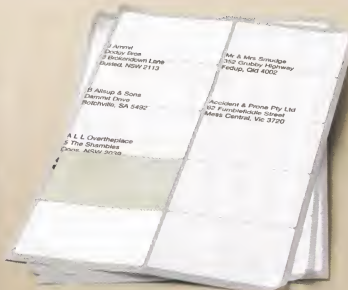
OPTICAL MEDIA THE LESSER EVIL?

My Maxtor external hard disk recently died just two months after I bought it. I heard a couple of "glitching" noises from the drive and when I tried to access it, the entire computer froze. After a reboot, all my data on the drive was lost and Windows says it is now unformatted.

I originally bought the drive to store extra data and videos after hearing how easily CD-Rs and DVD-Rs can be scratched and rendered useless. But now I'm seeing exactly the opposite. The DVD-Rs are still readable, yet this hard drive has already failed.

Of course, with any product line, individual failures can occur and that's why we have warranties. But there's no warranty on my data, and that's by far the most valuable part of a hard drive. I will now think twice before entrusting my data to a "backup hard drive" in the future.

George Xing
Tuat Hill, WA



Stuff up.



Thumbs up.

With DYMO LabelWriter there's no more off-register printing, no more waste. It plugs into your PC or Mac and sits on your desk printing up to 32 perfect labels a minute. It has its own software and links with other popular software too. Choose from up to 40 label types (address, shipping, CD/DVD, file folders, you name it), print one label or hundreds. Check it out on our website - www.dymo.com.au



DYMO
THE EASIER, THE BETTER

► developers could easily build this signature into their products, and governments could facilitate the distribution of digital certificates. Action could then be taken against spammers by authorities.

With a push for more international cooperation, countries that don't comply with the requirements could be blacklisted, and they would quickly fall into line.

On the educational front, how about governments putting some money into a mainstream media TV, newspaper and billboard campaign advising people not to buy anything from a spammer, ever? I often wonder who is stupid enough to do so, but those who do simply may not know that they are adding to the problem.

David Macaulay
Ascot Vale, Vic

TELSTRA GOES BACK TO THE FUTURE

Having tried on and off for several years to get ADSL in my street, I was pleasantly surprised on one of my forays to Telstra's Web site to find that I was finally eligible for broadband. Hurrah, I thought, at last! I can retire my poor old Linux gateway dialup and get better than a 48Kbit/s connection.

Having had dealings in the past with our largest telco, I decided to double-check with a real person rather than trust a search on the Web site, as I have no intention of using Telstra broadband but would rather connect with my local ISP. "Oh yes, you can get ADSL," I was told, "but we don't have any ports to connect you to at your exchange."

On application, my ISP informed me that Telstra had advised them that I would be connected at 12am on November 11, 2011. Brilliant service! However, here's the kicker. My neighbour was talking to a Telstra representative who told him that ADSL would be available in our neighbourhood as soon as this June or July. What's the story? Do they just keep people hanging on or are they, as I suspect, simply hopeless?



Have your say

Add to these discussion threads or email your views (in fewer than 250 words) to opinions@apcmag.com.

All correspondence becomes the property of APC and is subject to editing. Letters sent to opinions@apcmag.com must include the writer's full name, suburb, state and phone number to be considered for print publication and to be in the running for Letter of the month prizes. Phone details will not be published.

I live in a large city two hours north of Brisbane, not out in the sticks. I'm sick of seeing adverts on TV pushing broadband, only to find out that bean counters in the system will not spend some of the vast profits they make to allow "country bumpkins" like me access to services. I give up.

Tony Parsons
Gympie, Qld

TAKING WINDOWS TO TASK

People are constantly having a go at the Windows taskbar, but it works really well for me. I don't think I would use a tabbed browser either.

I routinely have more than five instances of a window open in my taskbar at a time, and I can do this by orientating it down the right-hand side rather than the bottom of the screen.

It's such a small thing but the benefits are huge: real estate for quick launch buttons; a huge system tray that will purge "grouping" forever; a system tray that can expand to its heart's content; and, last but not least, the full time and date. Sure, it takes a little getting used to, but once you do, you'll never go back.

Nick Henry
Mount Gravatt East, Qld

LOOK TO LINUX FOR BASICS

With all the good articles and letters APC has had about Linux, maybe we should look in that direction for an alternative to "simplified Windows" (APC June, page 28).

Consider a system installed with your choice of Linux distro, OpenOffice, Firefox and Thunderbird, along with some other apps to allow you to work with multimedia. Just install XFCE or another simple and uncluttered window manager, set up the menus (if that hasn't already been done automatically), and away you go. I haven't been able to test this, but I'm fairly sure it would run on hardware with minimal specs and use less than 1GB of hard drive space. If the system was slow, you could try using different apps or older versions.

Someone should make an ultra-simple CD installer for this, as well as a LiveCD to allow people who want an instant alternative to Windows to simply boot off the disc.

For something smaller, DamnSmallLinux or FeatherLinux can both be housed on a USB flash drive.

Adam Baxter
Naraama, NSW



FREE ADVICE

I've discovered a useful tip for Microsoft Office users I'd like to share with APC readers. It allows you to make shortcuts to folders within Microsoft Office apps like Word or Excel. Here's how:

1. Go to File > Open.
2. Enlarge the Open window by dragging on the bottom right corner.
3. Right-click on an icon on the left, such as Desktop, and select Small Icons.
4. Navigate to a folder you use regularly, and click on it once to highlight it.
5. From the Tools menu, choose Add to My Places.
6. The name appears with a folder icon.
7. Repeat the process for each folder shortcut.
8. Right-clicking on the icons lets you remove or rename them.

These shortcuts appear in the Save As window and all other Microsoft Office programs.

Sandy McClinton
Armidale, NSW

Send us your tips and share your time-saving ideas with over 239,000 other APC readers. Email opinions@apcmag.com and include screenshots.

Error log

In APC's review of OS X 10.4 (APC July, page 32) an incorrect statement was inadvertently included.

"Tiger won't talk to PCs" should have read "Apple's .Mac service won't synchronise data with PCs". APC apologises for any confusion caused.

APC's sub-\$2,000 PC article (May 2005) recommended an AOpen H500W case with a 350W power supply. Unfortunately, the case pictured was an Antec SLK2650-BQE. APC apologises for any confusion caused. The recommended case remains the AOpen H500W.

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apc Labs Challenges

56 **Hardware** **8ms 17in LCD** **panels**

Space-saving and easy on the eyes, LCD screens are increasingly popular both at home and in the office. *Tim Dean* looks at seven options.

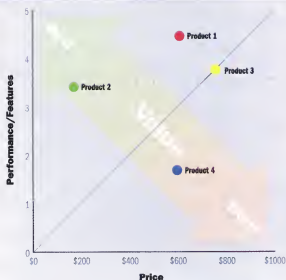


60 **Hardware** **Media centre PCs**

Media centre PCs continue to evolve, but are they ready for the living room? *Tim Dean* screen tests six potential stars.



apc price-to-performance ratio



The APC price-to-performance ratio is a scatter graph, each point representing a reviewed product. The X axis represents price, and the Y axis indicates features and performance as derived from the verdict awarded to each item. The diagonal line represents a line of expectation — as prices increase, a proportional increase in features or performance is also expected.

32 **System Dell Precision 380**

So far, most manufacturers have offered a lukewarm response to BTX. *John Gillooly* thinks the form factor deserves better.

36 **CPU AMD Opteron 875**

Stellar performance makes AMD's latest 64-bit CPU a worthwhile investment — for now and the future.

38 **System PalmOne LifeDrive**

PalmOne revolutionises the handheld market with an excellent new product.

40 **Hardware Canon PIXMA iP90**

This printer completes the travelling office for mobile professionals.

40 **Hardware Brother HL-2070N**

Small offices with fast printing requirements will love this Brother.

42 **System Ipex AllStation X**

Clever case design helps standard desktop components fit into a small form factor.

42 **Hardware Ricoh Aficio CL4000DN**

Ricoh delivers a tempting reason for SMEs to ditch their ageing InkJet printers.

44 **Hardware Maxtor Shared Storage Drive**

Cheap and simple network services for the home and small business.

44 **Hardware ECS PF88 Extreme Hybrid and A9S expansion card**

This card is a hybrid by name, and a hybrid by nature. And that means compromises.

46 **Operating system Mac OS X 10.4 Tiger Server**

Apple has largely succeeded in making the task of running a Windows-friendly Unix server a point-and-click affair.

48 **Operating system Windows XP Professional x64 Edition**

It's long overdue, but is it really a case of better late than never?

48 **Software GetData Recover My Files 3.4**

Backing up is vital to protecting data. But what if you forget?

50 **Software FileSphere Professional 2005**

Here's a simple solution for keeping tabs on documents.

51 **Software Mandriva Linux Limited Edition 2005**

Stay ahead of the crowd with Mandriva's latest Linux distro.

52 **Best Buys**

Every month, APC compiles this guide to the hottest software and hardware products on the market.

Dell Precision 380



Fine detail: the Precision 380 marks a radical change in case design from Dell.

So far, most manufacturers have offered a lukewarm response to BTX. John Gillooly thinks the form factor deserves better.

To date, the majority of both component manufacturers and system builders have shown little interest in implementing Intel's BTX form factor. Dell, however, has embraced the standard and recently began transitioning its product lines to the platform.

One of the first cabs off Dell's BTX rank is the Precision 380 workstation. Based on the Intel 955x chipset and a dual core 2.8GHz Pentium D CPU, it could also be seen as the poster child for the new "platformised" Intel corporate structure. But just slapping that label on the system would trivialise a very robust, mid-range workstation product that uses the new technologies to great effect.

THE RACE IS ON

Consider dual core processors. Intel knows that gamers are often the earliest adopters of new desktop PC tech, so the company has marketed its Pentium D product as a perfect gamer CPU. The reality is that the first multithreaded PC games are still a year or so away from release, and probably several years of mainstream adoption. On the other hand, multithreaded workstation apps are already common, thanks to a heritage of dual processor workstations that goes back many years.

In fact, much of the desktop PC technology used inside the Precision 380 has come from workstations gone by. Storage is provided by two 80GB SATA hard drives running in a RAID 0 configuration. Memory needs are handled by two DDR2-533 DIMMs running in dual channel mode, and Gigabit Ethernet comes as standard. The all-important graphics needs are handled by an entry-level professional 3D card, the ATI FireGL V3100.

The only incongruous piece of hardware in the Precision 380 is a Creative Sound Blaster Audigy 2 soundcard. The motherboard has Intel HD integrated audio, which should be sufficient for everyday usage. If the workstation is to be used for audio production, a higher-end soundcard would need to replace the consumer-focused Audigy 2.

WHEN I'M X64

The review unit came loaded with Windows XP Professional; however, you can spec the unit to use Windows XP Professional x64 Edition. For desktop users, the x64 configuration is little more

than a technical curiosity; APC's experience with the operating system has been that the frequent niggling incompatibilities with even recent software far outweigh the meagre benefits that 64-bit Windows offers for the desktop.

It's worth investigating the status of 64-bit versions of the main workstation applications you will be running before choosing between 32- or 64-bit Windows. For those wanting to take advantage of Windows XP Professional x64 Edition and 64-bit applications, the Precision 380 is capable of supporting up to 8GB of ECC DDR2-533 memory.

THE FORM FACTOR

BTX is an interesting beast, involving a major reworking of the innards of the modern PC. It's designed around unobstructed front to back airflow, allowing more efficient cooling of Intel's toasty processor while minimising the number of fans and their accompanying noise level.

An efficient case cooling system will ensure optimum performance from Intel's CPUs. Traditional means are struggling to do this, which is why Intel is pushing BTX.

The most striking change in the Precision 380 is that the processor has been moved away from the top corner near the power supply. It now sits at the front and centre of the motherboard, with the hefty BTX heatsink bolted through the motherboard into the case itself. The heatsink is encased in a shroud that allows air to be drawn through the front, vented across the CPU and RAM, and then discharged from the case's rear grille.

Unlike Dell's new desktop design, and the handful of other BTX systems that have passed through the APC Labs, the Precision 380 doesn't have the shrouded heatsink mated to the front

Details

Contact	Dell
Phone	1300 303 107
Online	www.dell.com.au
Price	\$2,599 (as tested, including delivery and three-year warranty)
Intended market	Business/prosumer
✓	Robust workstation solution.
✗	Needs customising for specific usage; contains game-oriented soundcard.
Verdict	★★★★☆

Benchmarks

PCMark04		
0	5,057	6,000
Business Winstone 2004		
0	20.3	40
Multimedia Content Creation Winstone 2004		
0	20.2	40
Linnpack		
0	852.5mflops	1,000

Easy does it: the Precision 380 is a fair performer across all benchmarks.

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► intake on the case. Despite the offset design, no cooling problems were experienced during testing.

Excess air is also vented through the power supply, which remains in its traditional location. This is the ideal position for it to suck out the hot air that rises to the top of the case.

One other radical change with BTX is that 3.25in drives no longer mount in the traditional rack at the front of the case due to the need for unimpeded airflow through the front intake. The drives are instead mounted at the base. This placement raises some questions about the expandability of the storage capacity of the system, as the new location doesn't allow for spare 3.5in drive bays without sacrificing other 5.25in devices (such as a second optical drive).

CLEAN AND TIDY

Despite the radical repositioning of the PC internals, Dell has managed to keep the system uncluttered and the airflow is unimpeded by cabling. The system has a tool-less design — the side panel is held in place by a latch on the top of the case, while the majority of components you'd need to access are attached with various plastic clips.

One downside to the combination of the BTX heatsink and the solid steel case is that this system is incredibly heavy. While definitely a bonus from a security standpoint, it's difficult to move around.

If you do need to shift the system, Dell has constructed the raised section over the air intake from steel, and it can be used as a handle. Be warned that the gap between the pseudo-handle and intake grille is fairly narrow, so it could be difficult for those

with larger fingers to get a grip.

The case is designed to work standing upright or laying flat. When ordering the system however, you need to specify whether you want it set up in desktop or mini tower orientation. This determines which way the modular external drive bays are configured, and ensures that optical discs are loaded horizontally. The orientation of the drive bays is the only major difference between ordering the system as a desktop or mini tower.

PERFORMANCE

Component-wise, the Precision 380 is a mid-range to entry-level workstation designed to support higher specifications if needed. This is exemplified by the use of the Intel i955X chipset, which was meant to be paired with the dual core Pentium Extreme Edition CPU.

The hard drives are both 7,200rpm SATA II models, although the system can be specced to use 10,000rpm drives for increased disk access speed. RAM is dual channel DDR2-533, but the 380 can also support ECC RAM if needed. Similarly the graphics card, while a workstation product, is at the bottom end of ATI's FireGL range.



That's hot: this shrouded heatsink is central to the BTX concept.

Although based on ATI's desktop 3D graphics products, this entry-level FireGL V3100 card is targeted at CAD and digital content creation. It features four pixel and two vertex pipelines, and a 128-bit memory bus. The difference between this and an equivalent low-end ATI X300 graphics card is that the FireGL drivers are optimised and certified for these workstation applications rather than gaming.

For those looking at a system more suited to real time 3D applications, Dell offers upgrades to cards with feature sets focused more on professional 3D graphics performance with options all the way up to the top-of-the-range Nvidia Quadro FX 4400.

All of this information was taken into consideration when running the benchmark tests in the APC Labs. Unsurprisingly, the Precision 380 didn't break any performance records, scoring 26.2 under Multimedia Content Creation Winstone and 20.5 under Business Winstone. The impressive result of 5,057 in PCMark04 was largely driven by the use of the Pentium D CPU.

VERDICT

The Precision 380 is a textbook example of how Dell operates. As tested, the system is a reasonable performer for the price. However, it's really a blank template waiting to be customised to suit your needs. The inclusion of the gaming-focused Audigy Z2 soundcard is unusual as the integrated Intel HD audio should be sufficient for most needs.

But where the Dell Precision 380 really shines is in the case design, with its efficient thermal performance, solid construction and ease of access. **EDIT**

Hot topics

As semiconductors and cases get smaller and bring components closer together, CPUs will give off increasing amounts of heat. Smaller die sizes also mean that the contact area for heatsinks to sit on is reduced, which decreases the cooler's thermal efficiency.

This problem has been the major driver of system design for some years now, as the need for more megahertz has pushed processors to the thermal edge.

One of the first steps that Intel took to assist in cooling was the introduction of heat spreaders, a feature which is now standard on both Intel and AMD CPUs. This involved casing the processor die in a slab of metal in order to provide more contact area for the heatsink.

Advances in cooling technology have also crossed over from notebooks into desktop CPUs. Thermal throttling is used in both the Pentium 4 and Pentium D to decrease processor frequency when overheating is imminent. Many desktop heatsinks also employ notebook PC heat pipe technology to efficiently transfer heat away from the CPU.

However, the ultimate solution from Intel involves the combination of the BTX form factor and the Pentium D processor. The combination of BTX's redesigned system airflow and the ability to use two Pentium D processor cores, which run slower than the equivalent Pentium 4, should allow performance barriers to be pushed for some time yet.

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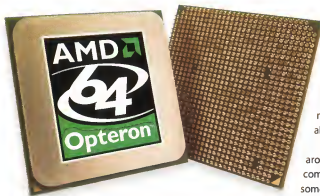


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AMD Opteron 875

Stellar performance makes AMD's latest 64-bit CPU a worthwhile investment — for now and the future.



Future-proof: the hardware is here, it's time for software developers to catch up.

Given that technology is developed primarily to make life easier (well, that's the theory), it makes sense that the more it can do, the more people want to do all at once.

Intel began tossing around the idea of parallel computing (Hyper-Threading) some 10 years ago. And now, with the benefit of hindsight,

it seems a perfectly natural progression to be working with multi-cored CPU parts.

CPUs are seldom used for a single operation, more often juggling multiple jobs on the desktop in addition to the overhead of the operating system. The CPU kit reviewed here included a pair of dual core 90nm Opteron 875 chips on a Tyan CK804 nForce Professional reference motherboard and 8GB of registered PC3200 memory.

The 875 is a socket 940 server part, clocking in at 2.2GHz and packing 1MB of level 2 cache per core. The use of SOI (Silicon On Insulator) chip fabrication helps reduce the CPU's heat output during operation, making it perfect for use in workstations and 1U rackmounts.

THE ART OF SCIENCE

To date, there haven't been many compatible benchmarks available for the 64-bit platform. The Opteron 875 was tested on a Windows XP 32-bit system using ScienceMark's Primordia test with Cesium (Ce) as the calculating element, Cinebench 03, PCMark04, and Halo with the 1.0.5 patch. The tests were performed on a single Opteron 875 CPU (two cores) and then on two CPUs (four cores).

Primordia is a great memory subsystem and floating point-intensive benchmark designed for single-threaded operation. That said, the gap between single and tandem dual-core CPUs was 13 seconds of calculation time, the two chip rig finishing in seven minutes and 25 seconds. While 13 seconds may seem small, it demonstrates the potential gains of the platform — imagine this with eight dual-core chips, or eight eight-core chips.

Cinebench gives a clearer differentiation, showing nearly twice the performance when all

four cores were under heavy load. This test gives a snapshot of the real world performances for graphical workstations, and demonstrates what can be expected when using software threaded for multiple data streams.

PCMark04 was run to simulate a typical 32-bit workstation environment, creating spreadsheets, virus scanning, spell-checking and basic 3D usage. Its score of 6,507 is on par with — if not exceeding — current enthusiast-grade desktop hardware, such as AMD's own FX55 and Intel's Extreme Edition.

TRICKLE-DOWN EFFECT

There's no doubt that the release of Windows XP Professional x64 Edition (see review, page 40), the porting of existing software, and the development of new productivity and entertainment programs to take advantage of the architecture will yield more impressive results in the future. For the moment though, AMD's front line server platform absolutely deserves every scrap of the attention it's getting, and the trickle-down to the consumer desktop price point in the form of the Athlon 64 x2 is eagerly awaited.

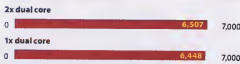
Dan Chiappini

Details

Contact	AMD
Online	www.amd.com
Price	US\$2,649 (in 1,000 unit quantities)
Intended market	Enterprise/business
	Blitzing speed; 32-/64-bit support; potential to grow.
	Very little supporting software; expensive.

Benchmarks

PCMark04 measured in PCMarks



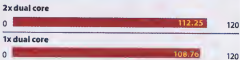
Cinebench 03 measured as CB-CPU2



ScienceMark Primordia measured in seconds where less is better



Halo measured by average frames per second



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D495

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128MB ATI Radeon 9700 graphics
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PERFORMANCE



G556

Intel® Pentium® M 755 Processor 2.0 GHz
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DVD Dual Drive
Windows® XP Home Edition

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D43EF

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Built-in Camera

● SCHOOL WORKS

532

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● 64 - BIT POWER

D410J

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Landscapes or portrait? Switch orientations with the push of a button.

Tungsten E2

Along with the LifeDrive, palmOne has also released the \$399 Tungsten E2. About the same size as the Tungsten E, it has 24MB of accessible RAM and boasts a far better screen and Bluetooth.

As well as Bluetooth, connectivity is available via the new Multi-Connector. The RAM is of the same non-volatile memory that's now a standard feature across the entire palmOne line.

The processor is an Intel XScale unit clocked at 200MHz. Its Speedy benchmark result of 993 isn't high, but the E2 is responsive in real world use.



Details

Contact	palmOne
Phone	(02) 9844 5420
Online	www.palmone.com/au
Price	\$899
Intended Market	Prosumer
✓	Huge storage; extensive connectivity options.
✗	Chunky.

Verdict ★★★★★

PalmOne LifeDrive

PalmOne revolutionises the handheld market with an excellent new product.

PDA aficionados have been waiting for a device with multi-gigabytes of internal storage, and not only has palmOne upped the ante with the LifeDrive, it's debuting a new product category at the same time.

The LifeDrive is the first product in palmOne's new Mobile Manager line. Superficially, it looks a lot like the Tungsten T5, but a closer inspection reveals that it's thicker and heavier at about 190g and 12 x 8 x 1.5cm (WHD). The device is dominated by its impressive 4in, half VGA (320 x 480) display. Equally impressive is the Hitachi 4GB micro-drive, which provides a massive 3.85GB of available space in addition to 64MB of RAM.

PalmOne has done some extensive revamping of its software to take advantage of the LifeDrive's storage capacity. For a start, RealPlayer has been dropped from the standard palmOne application suite and replaced with Pocket Tunes. This provides improved playlist management and gives greater flexibility in managing music collections, with support for artist, genre and other classifications. Music can be played back through the embedded mono speaker or stereo headphone jack.

The LifeDrive's SDIO slot means it can accept storage cards from many digital cameras, while the bundled palmOne Media application allows you to view photos, create slideshows and play them back to a soundtrack — you can even record your own narration. Depending on the resolution of your camera, palmOne claims that the device can store up to 48,000 images.

You could be forgiven for thinking the LifeDrive is little more than a portable media companion, but the advances are more extensive. While most

of palmOne's current devices include Bluetooth, the LifeDrive is the only one to also bundle 802.11b Wi-Fi. Connectivity to wireless LANs is easy — similar to the SDIO card palmOne released last year — and you can take advantage of this connectivity with the Blazer Web browser and VersaMail email client.

Along with email connectivity, the LifeDrive also supports connection to Microsoft Exchange servers using the recently licensed ActiveSync conduits, meaning that email retrieval doesn't have to be a collection activity; there's also the opportunity for BlackBerry-like email push connectivity.

Further support for business tasks is handled via the latest release of the DataWiz Documents-to-Go application suite. It provides the ability to read and write Microsoft Word and Excel files, and PowerPoint presentations. The accompanying CD also includes Adobe Acrobat Reader for Palm OS.

The LifeDrive runs the Garnet 5.4 operating system and includes excellent PIM applications for personal data management. Given the increased file storage capacity, palmOne has bolstered its package with a new file management application that's assigned to a button, making it easy to move files from RAM to the hard drive.

Desktop connectivity is achieved through a Multi-Connector cable — no cradle is supplied. In addition you can use Bluetooth to sync wirelessly. Like the Tungsten T5, the LifeDrive supports Drive Mode so you can connect it to any computer with the cable and use it as a portable hard drive. All of the data on the hard drive and in RAM is non-volatile, so your information is safe in the event of a total power loss.

The 1,660mAh Lithium-ion battery isn't user-replaceable. In testing — which consisted of a selection of music being played in a loop from the hard drive with the volume set at 80%, the screen on medium brightness, and with Bluetooth and Wi-Fi activated — the LifeDrive

provided approximately three hours of power. This is quite good considering the hard disk was being accessed constantly. Once the wireless communications and display were turned off, playback increased to nine hours. Thanks to the LifeDrive's Intel XScale processor running at 416MHz, benchmark testing with Speedy 4.1 produced a respectable score of 1,667.

The palmOne LifeDrive is designed to store your entire digital life, so you can take your documents, photos, music and other files with you anywhere.

Anthony Caruana



That's life: store all your favourite memories on a tiny PDA.



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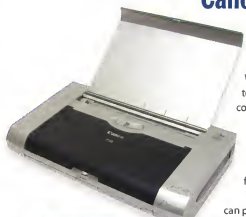
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The Network is the Computer™

Canon PIXMA iP90



This printer completes the travelling office for mobile professionals.

With a sleek and light weight design similar to its predecessors, the PIXMA iP90 is a compact and highly portable inkjet printer.

Cast in a simple, aluminium-finish plastic case, the iP90 weighs 1.8kg and measures 31 x 5.1 x 17.5cm (WHD). The lid pops open to perform the task of input tray, with the finished page exiting from the front.

Displaying admirable versatility, the iP90 can print directly from your digital camera, PDA or even mobile phone via the PictBridge and IrDA ports. There's even the option of adding a Bluetooth connection (\$129), and attaching a Lithium-ion battery (part of a \$199 kit that includes the battery, charger and housing) for extra mobility.

Following the instructions and setting up the iP90 with the print head and ink tanks is simple, and you should be up and running in a matter of minutes. However, you need to have your own USB cable if you want to connect the printer to your PC in the traditional way.

The iP90 printed a standard Word document at 8ppm, the output provided reasonable text

quality, though it lacked the crisp blackness and sharpness that laser or desktop inkjets can produce. Image output didn't have the necessary richness of colour and accuracy when it came to fine detail.

However, this device's strength lies in the fact that it can quickly and easily serve up images in a variety of formats (including standard 4 x 6in photo print), controlled simply from Canon's Easy-PhotoPrint software. The printouts were reasonably clear, smooth and free from overt dithering or pixelation, making the PIXMA iP90 ideal for business applications, sharing images and making postcards for friends and family. The paper tray can hold up to 30 plain paper sheets, or 10 sheets of 4 x 6in photo paper.

During testing the iP90 drained the ink cartridges rather quickly. In spite of Canon's new Save Black Ink mode which claims to give a 66% higher print yield. Using this new mode or the Use Composite mode (which attempts to create black from the colour cartridges) significantly reduces the quality of the text.

Overall, the PIXMA iP90 produces prints that are surprisingly accurate and detailed considering its intended function as a go-anywhere printer.

Ashok Zaman

Details

Contact Canon

Phone 1800 021 167

Online www.canon.com.au

Price \$449

Intended market Everyone

✓ Lightweight; versatile photo and text printing.

✗ Ink drains quickly; print quality sacrificed for mobility.

Verdict ★★★★★

Brother HL-2070N

Small offices with fast printing requirements will love this Brother.



Designed as an entry-level workstation laser printer, Brother's HL-2070N aims to meet the needs of those who want fast monochrome A4 printouts.

To achieve this, the company has included a 250-sheet input tray and given the printer a maximum resolution of 2,400 x 600 pixels, 16MB of onboard memory and drivers for PCL and PostScript printing. This ethos carries through into the flexible connectivity options, with the HL-2070N capable of connection by FireWire, USB 2.0 or 10/100 Ethernet. Mind you, this flexibility stops short of Brother including the necessary cabling.

As might be expected from a printer at this price, the HL-2070N lacks automatic duplexing. Brother instead relying on its drivers to set up manual duplexing operations. The HL-2070N also includes the BR Admin software, which gives access to the printer when connected via Ethernet.

In testing, the HL-2070N delivered an average print speed of 15ppm against the 20ppm quoted by Brother. The paper output groove on the top of the

printer rapidly filled with pages, and while this won't be a problem for most users, offices where documents are often left in the printer will soon run into overflow problems.

The HL-2070N coped well with the monochrome test image. Lines were crisp and sharp, even at fine resolutions, a trend backed up by the sharpness of the test Word document. The only letdown in the quality tests was the weak gradation visible in the printer's greyscale capabilities — the colour transitioned to pure black after just four bars of a 10-bar greyscale test image.

Consumables consist of a standard toner cartridge capable of 2,500 prints at 5% coverage, and a drum capable of 12,000 prints. In a refreshing move, Brother has included these full capacity products in the box rather than selling them separately as a starter kit.

Overall, the HL-2070N is a robust solution for a small office environment. Where it falls down is in its poor greyscale capabilities, which are adequate for simple vector graphics but just not up to scratch for rendering raster images in any great detail. Its major strength is delivering crisp, clear text — the basic role of this kind of printer.

John Gillooly

Details

Contact Brother

Phone (02) 9887 4344

Online www.brother.com.au

Price \$499

Intended market Small business

✓ Quick, clear document printing.

✗ Disappointing greyscale results.

Verdict ★★★★★

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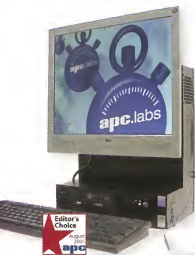
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JVC

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Details

Contact	Ipex
Phone	1800 057 477
Online	www.ipex.com.au
Price	\$2,952.40 (as reviewed)

intended market	Business
-----------------	----------

✓ Quiet; well-designed system.

✗ Only accepts half-height cards; notebook floppy drive.

Verdict ★★★★★

Ipex AllStation X

Clever case design helps standard desktop components fit a small form factor.

Business PCs are generally niche, specially engineered systems that employ proprietary hardware to cut down the system size and complexity. The AllStation X review system features a 3.6GHz Pentium 4 processor (Intel has qualified the system for use with processors up to 4GHz), 1GB of RAM, a 74GB Western Digital Raptor Serial ATA hard disk, and a Mini-ITX motherboard based on the Intel 915G chipset. A 5.25in DVD/CD-RW combo drive is also included as standard.

Despite the scant 32 x 20cm footprint, the cleverly designed case crams all components in while maintaining adequate cooling. In fact, the only concessions made to space-saving hardware are the use of a notebook floppy drive (though it can be swapped out for a card reader) and a restriction to half-height PCI/PCIe expansion cards.

Six USB 2.0 connectors, parallel and serial, PS/2, Gigabit Ethernet, VGA and DVI are included. You can even run a dual-monitor setup. There are audio connectors and two side-mounted USB 2.0 ports on the right-hand side, spaced widely enough to fit two bulky memory keys simultaneously.

Benchmarks



A VESA-standard monitor mount is provided, allowing you to adjust the height and angle of the screen. It's compatible with any VESA-compliant TFT panel from 15 to 21in.

In benchmark testing, the system performed exceptionally well and the cooling fan remained quiet throughout the process.

Ipex offer a range of value-add software suites to help sway large-volume customers. These include: updating the SOE (Standard Operating Environment); running hardware auditing software across a network; and the Ipex Device Manager (IDM), which updates driver packs between hardware generations.

Ipex has done an excellent job of combining easily reachable parts in a case that provides ergonomic adjustment and effortless access to ports. A three-year onsite warranty costs an additional \$110, but it's well worth the expense.

Matthew Overington

Ricoh Aficio CL4000DN

Ricoh delivers a tempting reason for SMEs to ditch their ageing inkjet printers.

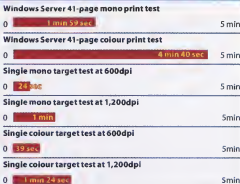
Designed as an office all-rounder for SMEs, Ricoh's CL4000DN laser printer is capable of high speed monochrome and colour printing.

In testing, text appeared solid and very readable, without any hint of misshaping or bleed of the characters. The 41-page mono test document printed in just under two minutes, and the same test with colour took four minutes and 40 seconds. The "fast" mode only shaved off one second, with very little difference to the quality of the image.

Print resolutions of 600 and 1,200dpi were tested under monochrome and colour modes. Image quality noticeably improved at the higher resolution, with a slight colour over-saturation issue on the 600dpi prints corrected on both 1,200dpi samples. Gradients were smooth and there was no banding. There's no borderless printing function, so photos are output with a 4.2mm border.

The CL4000DN features a 500 page output tray, while the paper drawer and bypass feeder flap combined allow for 650 pages of up to 216gsm paper. Duplexing is supported. There's also an array of optional extras, including an 802.11b and

Benchmarks



Bluetooth module, memory upgrades and a 40GB hard disk drive for secure printing. Unfortunately, it's either LAN or WLAN, not both at the same time. The test unit came with 128MB of memory, and while it can be upgraded to 512MB, you'll need at least 256MB for 1,200 x 1,200dpi prints.

OS support spans the Windows family (with the exception of x64 Edition), Linux, Unix and Mac OS. The supplied software bundle of Document Management Utilities is Windows-only.

Best suited to the duty cycles and budgets of SMEs, text and image quality are acceptable for presentations, but hold on to your inkjet for photos.

Dan Chiappini



Details

Contact	Ricoh
Phone	1800 181 002
Online	www.ricoh.com.au
Price	\$3,190

intended market	Business
-----------------	----------

✓ Fast; produces great text; good colour prints.

✗ No borderless prints; Windows XP 64-bit Edition unsupported.

Verdict ★★★★★

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*APC survey Nov 2003 / Optional

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Maxtor Shared Storage Drive

Affordable and simple network services for the home and small business.

The Maxtor Shared Storage Drive is compact and comes in two configurations — 200GB with an 8MB cache, or 300GB with a 16MB cache — and runs a stripped-down, Maxtor-developed Linux operating system based on the 2.4 kernel.

After switching the power on, the installation CD scans the local network, detects the drive and sets up a secure user account. Each user's account, which assigns them space on the disk, is then mapped as a Z: drive, and a shortcut to the public shared space is dropped on to the desktop. The client CD is Windows-only, but Mac and Linux clients can connect manually using Server Message Block (SMB).

The drive can only be configured using a Web interface. Happily, this offers comprehensive control over the device — network and USB settings, device name, workgroup information and permissions. You can also create new shares and assign access. However, disk quotas can't be allocated.

Performance is adequate at 100Mbit/s, with a maximum throughput of 12.5MB/s. However, this rate decreases with each connected user because the network interface bottlenecks

when there are increased read/write hits on the disk.

Two USB 2.0 ports are located at the rear for connecting additional storage devices or USB printers. USB printing support doesn't require additional client software, it just has to be enabled at the Web interface. Once detected, the printer can be accessed from any networked client with Universal Naming Convention (UNC) standards.

It's possible to add extra storage, but the main unit only recognises FAT32-formatted partitions, as the disk itself has been formatted with ext3. Once plugged in, the new drive is instantly accessible and has a share created and assigned to it automatically, based on its name.

James Bannan

Details

Contact	Maxtor
Phone	(02) 9369 3662
Online	www.maxtor.com
Price	200GB, \$449; 300GB, \$549
Intended market	Everyone/small business
✓	Very easy to setup and administer.
✗	Performance problems with too many users.
Verdict	★★★★☆

Network storage

Networked storage solutions are popular within homes and small businesses as an efficient method of large-scale, accessible file storage without the price tag of a proper file server. Vendors such as Buffalo and LaCie sell similar products for this section of the market.

- Buffalo: www.buffalo-asia.com/australia_top.php
- LaCie: www.lacie.com/au

ECS PF88 Extreme Hybrid and A9S expansion card

This card is a hybrid by name, and hybrid by nature. And that means compromises.

Innovating for the sake of it seems a habit of some IT vendors. However, many differences are cosmetic rather than performance-based.

Enter the ECS PF88 Extreme Hybrid motherboard, which supports the LGA 775 Pentium 4 natively, and the Socket 939 Athlon 64 via the A9S expansion card. The company claims this development enables you to upgrade from a Pentium 4 to an Athlon 64 (running two CPUs simultaneously isn't possible).

In reality, it's basically just a cool trick based around the fact that the SIS 965 Southbridge chip is designed to be used with both Intel and AMD chipsets. This allows ECS to keep the various ports and expansion slots on the motherboard and build the riser card with a new Northbridge, CPU socket and RAM slots in order to allow for upgrades.

The PF88 uses a SIS 656 Northbridge for LGA 775 Pentium 4 CPUs, which supports 1,066FSB CPUs as well as four DIMM slots for DDR2 up to 667. The riser card uses a SIS 756 Northbridge, designed for Socket 939 AMD64 CPUs. It also sports two DDR slots.

Thanks to the SIS 965 Southbridge, the board has two x16 PCIe slots (although using the riser card makes one of these inaccessible), one x1 PCIe slot and three PCI slots. It uses a Realtek ALC850 chip for 8-channel audio, has Gigabit LAN and a total of six SATA ports. One FireWire port, four USB ports and headers are provided for more of each on the board itself. Four SATA II plugs and two Parallel ATA channels run from the chipset, and two more SATA II plugs control a SiI3132 controller chip.

These components are currently SIS's top-of-the-range offerings, but that doesn't mitigate concerns over the usefulness and longevity of this concept. They perform well and have a robust feature set at the moment, but you're locked into these features for as long as you use the board. The likelihood of someone upgrading to a new CPU in the time frame that would make the board economically viable is small to say the least. Add to the mix some seriously feature-rich chipset competition from Nvidia and Intel and the SIS chipset starts to look rudimentary.

The ECS PF88 Extreme Hybrid is an oddity in a sea of similarity, but it only delivers the appearance of flexibility. Once you take that away, it's just an average SIS chipset motherboard.

John Gillooly

Details

Contact	Protac
Phone	(02) 8748 8888
Online	www.protac.com.au
Price	\$260
Intended market	Everyone
✓	Allows upgrading to a new CPU without replacing your motherboard.
✗	Upgradeability of highly limited usefulness.
Verdict	★★★★☆

Toshiba recommends
Microsoft® Windows®
XP Professional.



*Family-Friendly Work Practices, Research Report No. 7, Australian Institute of Family Studies. Intel Inside, the Intel Inside logo, the Intel Centrino logo and Intel Centrino are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Toshiba (Australia) Pty Limited ABN 19 001 320 421. TS50013-4



Because
she's having
a baby, not
a lobotomy.

OBSERVATION: Advanced pregnancy is demanding, and it's just the beginning.

OPPORTUNITY: Ensure a fulfilling continuity of contribution for valued employees starting a family. Thereby retaining good people, strengthening loyalty both ways, avoiding the high costs of worker turnover and getting a real return on the corporation's training investment.

INSIGHT: Research* shows that workplace flexibility, which truly enables work/family balance, is highly valued. Specifically: control over start and finish times in order to meet the new and growing demands of family life; and the availability, at least as an option, of permanent part-time employment.

BOTTOM LINE: Managerial discretion plus a mobilised workforce is a powerful combination. Corporations that respect individual needs, that treat and equip their 'human resources' as resourceful (and trusted) humans, can achieve the healthy work/family balance critical to a continuously healthy balance sheet.

ACTION: Investigate where Toshiba mobile computing is now in 2005. The new Tecra S2, for instance, powered by Intel® Centrino™ Mobile Technology. Designed and engineered for the professional, well, juggler who will demand No Compromise from her desktop replacement.

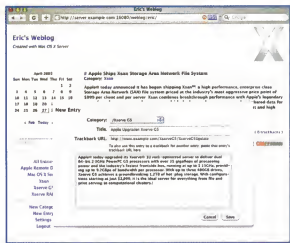
CONTACT: Your nearest Toshiba Authorised Reseller, visit www.isd.toshiba.com.au or call 13 30 70.



TOSHIBA

Mac OS X 10.4 Server

Apple has largely succeeded in making the task of running a Windows-friendly Unix server a point-and-click affair.



Blog off: use the built-in iWeblog server to brainstorm with colleagues about a project.

Configuring OS X Tiger Server is done via three straightforward apps: server manager, workgroup manager and system monitor.

The server manager turns system services on and off. These services cover a wide array of server tasks, including many that cost extra in other server operating systems. For instance, the mail server supports both POP and IMAP (based on the Cyrus open source mail server), and has built-in antivirus and antispy (based on ClamAV and

Spam Assassin). In addition to the Apache Web server with PHP and MySQL, Apple adds QuickTime Streaming Server for streaming audio and video.

Workgroup manager has some enormous improvements over OS X Server 10.3. It now enables the use of access control lists, rather than standard Unix permissions, which allow files, folders and network resources to have security rules defined with much more flexibility using Windows-like rules. In fact, Tiger's Access Control Lists communicate with Microsoft's Active Directory realms so that OS X servers integrate into mixed environments.

TIGER ROARS

For smaller offices with limited IT resources, Tiger Server has a focus on simplifying the configuration of some key server capabilities. For example, it can automatically configure itself to be an Internet gateway. Simply connect an ADSL modem to your Mac's Ethernet port and the Gateway Setup Utility guides you through setting up the machine to automatically hand out local network addresses (DHCP), share the Internet connection (NAT), firewall, and provide encrypted remote access to the office network (VPN).

Apple is throwing down the gauntlet to Microsoft's Live Communication Server with Tiger Server's built-in collaboration tools. It includes an encrypted instant messaging server based on the Jabber project, which works with Apple's iChat and

has Windows and Linux clients available. Chats can be logged for audit purposes. There's also a Weblog server, which allows for streamlined publishing of internal company blogs on ideas and projects.

For those operating a GS Apple XServer running the 32-bit Mac OS 10.3 or below, Tiger Server is excellent news as it allows 64-bit applications to run in memory spaces of up to 4GB each. This will be of most interest to scientists, because at present Apple's 64-bit implementation only works for pure C or C++ applications — its Cocoa and Carbon APIs aren't yet 64-bit-capable. Apple argues that's not a big problem because the scientific applications that need it can easily perform "heavy lifting" in the background and do the undemanding GUI front-end work in 32-bit, though with 64-bit Windows already released, APC can't really agree.

This dovetails with the XGrid functionality, which turns any networked group of Macs into a supercomputer environment. However, applications must be built to use XGrid resources, so don't expect it to speed up batch image processing in Photoshop.

THE PRICE IS RIGHT

Despite all of the above features, the single killer attribute of OS X 10.4 is its price. Windows Server 2003 costs \$1,999 for a 10-client licence, and a staggering \$6,799 for the 25-client Enterprise edition. In comparison, OS X 10.4 Server pricing is \$699 for a 10-client licence, and only \$1,499 for a version that allows an unlimited number of clients to connect. Apple's GS XServer servers (from \$4,995) include the unlimited version of Tiger server.

Of course, the cost of configuring and maintaining servers often dwarfs the cost of the server itself. Apple is also getting that side of things bedded down, with a three-year, \$1,495 service contract that provides four-hour onsite response for hardware failure (during business hours, depending on your location) along with 24-hour phone support for configuration queries.

The bottom line is that the cost of an XServer server bundled with the unlimited client licence Tiger Server plus three-year onsite support costs \$6,490 — \$309 cheaper than the 25-client Windows Server 2003 Enterprise software alone.

If you're interested in running OS X Server at home, you may be disappointed to discover that Apple has deliberately crippled its iLife application suite so that it won't run on OS X Server. This is presumably a security measure to dissuade home users from running pirated copies of Tiger Server, although Apple claims there's "little demand" for running iLife on a server.

Dan Warner



Details

Contact	Apple
Phone	13 36 22
Online	www.apple.com.au
Price	10 user version, \$699; unlimited user version, \$1,499
Intended Market	Business
✓	Excellent value, with many Apple additions to the open source base.
✗	Designed to run as a server only; some desktop apps won't run on it.
Verdict	★★★★☆

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30 Days ZERO DEFECT

**3 Years ONSITE
Pickup & Return
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- Swift 12ms response time
- Stereo speakers with headphone jack and mute
- Available in 17" and 19"
- DUAL Analogue+DVI inputs



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- iRelax™ eye fatigue reducer
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- DUAL Analogue+DVI inputs
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Speakers



TV Tuner



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Display Arm



NeoV Optical Filter™

Internal LCD Panel

Display Housing



The NeoV Optical Filter™ is a specially formulated, hardened, tempered, scratch resistant optical glass that is built on top of the internal LCD panel to dramatically enhance image quality and protect the screen from damage. The proprietary multi-coated optic filter delivers rich, vibrant colours and crystal clear image definition for ultimate clarity and reduced eye fatigue.

(NeoV received the "Best Innovation" award from PC Magazine in 2003).

Windows XP Professional x64 Edition



It's long overdue, but it is really a case of better late than never?

It's been nearly two years since AMD launched 64-bit processors for the desktop, and operating system support for 64-bit processing has finally moved into the mainstream. Based on the Windows Server 2003 kernel, Windows XP Professional x64 Edition is designed to support AMD's AMD64 architecture and Intel's EM64-capable processors.

But how does this update differ from the 32-bit version of the OS? On the surface, it's the same Windows XP, albeit with updated default wallpaper and screensaver. But delve deeper and you'll find some subtle but important changes.

Many of these involve the removal of support for legacy code and subsystems, particularly for 16-bit apps, Active Desktop and OLE Databases. There have also been some valuable additions in the form of 64-bit versions of Outlook Express and Internet Explorer. And the maximum memory size supported has leapt from 4 to 128GB.

In practical terms, the only compelling reason to upgrade is if you wish to use 64-bit apps, which are few and far between in the consumer realm. This will slowly change as more companies announce 64-bit versions of software, and as the availability of this OS facilitates more development for it.

The other major factor when deciding whether to switch to x64 is drivers. Most major component manufacturers have launched WHQL-certified drivers for the OS. However, it's advisable to check with hardware manufacturers to determine whether drivers are available.

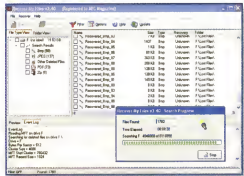
There are a few scenarios which make the upgrade appealing. Perhaps you're a developer and you want to get working with 64-bit Windows code in the lead up to Longhorn. Or maybe you're a user of memory-hungry 64-bit optimised workstation applications. But if you're driven by nothing more than natural curiosity, you'll find little advantage.

As noted above, this will change once more 64-bit applications hit the market, though it will take some time for the number of 64-bit apps to reach the masses. In the meantime, this is an interesting technological moment, but one destined to remain in a niche rather than the mainstream.

John Gillooly

Details	
Contact	Microsoft
Phone	13 20 58
Online	www.microsoft.com.au
Price	N/A (OEM only)
Intended market	Business/enterprise
✓	Can address up to 128GB RAM; runs 64- and 32-bit apps.
✗	Few compelling reasons to upgrade.
Verdict	★★★★☆

GetData Recover My Files 3.4



Backing up is vital to protecting data. But what if you forget?

Data loss can happen to anyone, even with regular backups. The two most common data loss scenarios under Windows are hardware failure and user error. File recovery applications can have some success with hardware malfunctions, depending on the nature of the error and the resources available to the user.

Where they shine is after an accidental file deletion, disk format problem or OS install gone wrong.

Recover My Files is designed to come to the rescue in the event of the latter, and includes a strong wizard interface for the most common recovery situations. This software can identify and retrieve file information left on a hard disk after a delete or format process.

When Windows deletes a file, it really just removes the reference information from the File Allocation Table (FAT). In other words, it basically forgets about the file rather than removing it actively. Recover My Files scans the disk at a low

level and makes matches on specific file types (of which 129 are supported), then re-creates the link so that you can either back up the data or save it again. The recovered files can be burned to DVD, CD, floppy disk, memory card or Zip drive.

A similar process works on formatted drives. The drive structure is rewritten from scratch based on the data left on the drive, and a FAT is created to access the files once more.

APC Labs tested the software by simulating a number of common scenarios in which the software would likely be used, and found that Recover My Files mostly did as it claimed. Files were recoverable in a reasonable amount of time with a minimum of guesswork using default settings. For a corrupted file system, recovering specific key files is possible, though time-consuming and not totally reliable.

The Labs also had the opportunity to give the pre-release version of Recover My Files 3.5 a spin, and a new feature offering a quick format recovery scan showed promising results.

If you've accidentally deleted files which you desperately need to recover, or wiped a functional file system and require some key files to be returned, this software suits the purpose.

Nick Race

Details	
Contact	GetData
Phone	(02) 9545 7788
Online	www.recovermyfiles.com
Price	\$100
Intended market	Everyone
✓	Good support for different file types; recovers deleted files effectively.
✗	Can't reconstruct a drive back to working condition.
Verdict	★★★★☆



Blockbuster magic, now showing on a small screen near you.

Avid Xpress DV, now pre-loaded with HP Workstation xw4200. Think real-time Special FX and one name literally edits out the drag of a boring video clip. Avid – for years, Hollywood's preferred partner in digital video editing. Cut to right here, right now; a time and place when Avid Xpress DV's astounding capabilities are being exclusively pre-loaded with the HP Workstation xw4200. Not only for use in Hollywood, but your homes and workplaces. Think about it. Avid's coming home to transform your lacklustre video editing project into an experience that's as thrilling as a Hollywood blockbuster.

So, why is HP teaming up with Avid? Well, Avid's real-time FX need the unrivalled power and stability of the HP Workstation xw4200. The workstation provides ultra-smooth processing with Intel's® Performance Acceleration Technology and nVidia's 3D graphics, as well as increased application uptime with Error Checking and Correction (ECC) memory. That's why HP is the only certified hardware partner for Avid's high-end editing solutions. Which include Avid DS Nitris, Avid MediaComposer Adrenaline, Avid Xpress Studio and Avid Xpress Pro HD.

Come, touch and feel video editing hardware and software that's great for homes and small businesses. You'll discover how the HP-Avid partnership keeps technology out of your hair, setting your creative juices free to pursue that elusive award – courtesy of the Academy. Or otherwise.



Avid Xpress DV Editing software

- 100+ customisable real-time effects
- One-step Auto Correct colour correction
- Award-winning user interface
- Upgradeable and 100% compatible with the entire family of Avid editing

Retail packaging is for placement only. Software comes pre-loaded.



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- Intel® Pentium® 4 Processor 3.20GHz
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- 16x DVD+/-RW Dual Layer
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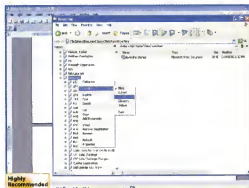
CLICK

www.hp.com.au/workstation

CLICK

www.avidaustralia.com.au/xpressdv





Details	
Contact	FileSphere
Phone	(02) 9913 3288
Online	www.filesphere.com
Price	Professional, \$450 per seat; Enterprise, \$1,250 including five CALs
Intended market	Business
✓	Fast, safe and slick document management.
✗	Some wrinkles in the initial data migration.
Verdict	★★★★☆

FileSphere Professional 2005

A simple solution for keeping tabs on documents.

Based around the concept of "Document Space" for file storage, the FileSphere Professional 2005 document management system maintains tight control over the movement of files within an organisation, while still making information

available when required.

By adding metadata to files, the database can then be referenced for easier sharing and searching. Migrating documents into the system is simple, though testing showed some confusion with documents using a file extension reserved for a different application (the most common case is RTF WordPad documents masquerading as Microsoft Word documents). According to the developer, this bug will be fixed in the near future.

Once files are imported into the Document Space, they can be organised using a range of customisable criteria. Under tests it proved extremely fast, listing files associated with a certain project, author, or created at a specific time.

Files exist in Virtual Folders under the main Document Space defined by metadata criteria, and actual files may exist under multiple Virtual Folders — since metadata is used to reference a file, its actual location is unimportant to the end user.

If you need a file housed on a server or another PC, the system will find and retrieve a copy, locking it into the My Workspace folder. When in My Workspace, other users can't change or save the file being worked on. A system for checking files in and out via email also exists — the file appears in a separate Inbox in My Workspace and can be worked on as normal. Files can also be exported to a local folder or sent via MSN.

FileSphere integrates into Microsoft Office and Outlook, with newly created and received files automatically entered into the Document Space.

This system excels when it comes to flexibility for multiple users in a networked environment. Storing files in a central location with users working on versions that can be tracked is a valuable resource for companies needing to maintain detailed records. And serving files from a server is much easier to manage than backing up personal data on every client machine.

Nick Race

Bonus POU2009

A Powerware for less than the price of an ordinary UPS

The new black range from Eaton Powerware

The name Powerware has long symbolised the very best UPS in the world. The reason for this is constant research and improvement of functionality and performance — and the highest quality standards. Sometimes though, this quality came at a price. So we've put our ingenuity to work to put the standards up — and the prices down.

Enter the Powerware 5110; this brilliant UPS is a great new example.

This 5 series UPS has all the features: automatic voltage regulation, power and telephone surge protection, hot swappable battery, Australian power outlets, management software — it will even send you emails or SMSs if the

Mandriva Linux Limited Edition 2005

Stay ahead of the crowd with Mandriva's latest Linux distro.

For Linux enthusiasts, there's nothing like the feeling of being at the forefront of technology. Mandriva Linux Limited Edition 2005 (LE) offers this opportunity in spades.

Packed with the latest applications, LE includes KDE 3.3.2, GNOME 2.8.3, 2.6.11.6 Linux kernel, Firefox 1.0.2, GIMP 2.2 and OpenOffice 1.1.4. It also comes with Blackbox, WindowMaker and IceWM environments. Cdrecord now supports DVD+R Double Layer burning and the latest versions of RealPlayer, GAIM, Grip, K3b, BitTorrent and Acrobat Reader. PDF, Flash, Java and RealPlayer browser plug-ins are also included. The result is an excellent out-of-the-box alternative to the Windows/IE/Office package.

A few installation methods are available: from the DVD, with the option to cache the files for future installs; CD-based install; or via mini-CD, which downloads the necessary files from the Internet.

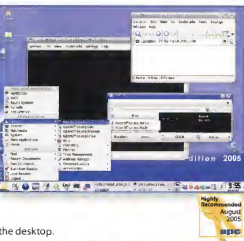
The most notable advances in this release are in the speed and stability of the operating environment; the hardware-accelerated drivers for Nvidia, ATI and Intel graphics cards; x86_64

processor support; and plug-and-play support for USB devices. The improvements in the KDE graphical system were made by the inclusion of the visibility GCC flag in the KDE binaries.

A few USB devices and FAT32-formatted flash drives were also tested with the distro. They were detected straight away and mounted according to their type, with shortcuts placed on the desktop. Other devices, such as USB IrDA adaptors and printers, were also made available without fuss.

Encrypted DVD support has also been improved. For instance, the Kaffeine player pops up whenever a commercial DVD is inserted and tells you which codecs are missing and where to get them from. However, some codecs can't be included due to legal restrictions in some countries.

Mandriva Linux LE is aimed at hard-core enthusiasts, but it's very user-friendly and doesn't sacrifice system accessibility for popular appeal. Which makes it well worth the US\$58.50 price tag.



Details

Contact	Mandriva
Online	www.mandriva.com
Price	Boxed, US\$87.28 including shipping; download, US\$58.50
Intended market	Everyone
✓	User-friendly; powerful; latest applications.
✗	Not a freeware distro.
Verdict	★★★★☆

James Bannan



batteries deteriorate. Plus it has two-year full warranty, five-year pro-rata warranty, and \$50,000 load protection guarantee. At a price you can afford it comes with all the cables and software you need to make it a complete package, how can you afford to not have your systems protected?

EATON

Powerware

Powerful Protection

Hit the shops

Stay on top of product releases with APC's monthly run-down of the best of the best.

The wonderful dovetailing of innovation and usability shines in this month's Best Buys. First of all, Maxtor has taken the network attached storage concept and delivered it for home users in the form of the Maxtor Shared Storage Drive, which carries a large storage capacity with a network attachment. Thanks to its USB ports, the device can be expanded with additional hard drives or even act as a network printing adaptor, providing a compelling product for the data-heavy home or small business.

The other new entries are the two outstanding performers from this month's 17in TFT monitors Labs Challenge. ViewSonic's VP171b is an all-round star, with fast refresh, smooth greyscale and impressive balance and contrast. CMV's CT-720D is also an excellent product, combining above average performance with a very reasonable price tag.

Each state and territory has its own fair trading legislation designed to prevent consumers being mistreated by vendors or retailers, but the national Trade Practices Act 1974 provides protection across a range of areas. It provides guidelines for warranties, sets the standard for "merchantable" quality goods and offers protection against misleading conduct by retailers. The Federal Government's consumer portal can be found at www.consumeronline.gov.au.

The Australian Competition and Consumer Commission (ACCC) also offers protection. It can be reached at www.accc.gov.au.

Processor/motherboard

ASUS A8N-SLI Deluxe/ AMD Athlon FX-55



ASUS' A8N-SLI Deluxe offers great performance, SLI capabilities, three PCI slots and support for eight SATA II drives using onboard NVRaid. Audio includes onboard digital and optical S/PDIF outputs. The two Gigabit Ethernet ports have ASUS' AI NET 2 cable fault technology enabled.

The software package includes Nvidia nTune and Firewall, ASUS PC-Probe and AI Booster, Norton Internet Security 2005, Winbond Voice Editor, and InterVideo WinDVD. Add AMD's Athlon FX-55 processor, and you've got a super-fast solution.

Details

Contact	Achieva
Phone	(02) 9742 3288
Online	www.achieva.com.au
Price	Motherboard, \$299; processor, approx. \$1,400

ASUS A7N8X-E/AMD Sempron 2600+

AMD's entry-level Sempron processors offer a 333MHz FSB and 256KB of Level 2 cache.

Enhanced Virus Protection is built in and enabled by Windows XP. Combine the chip with an ASUS A7N8X-E Deluxe motherboard for a powerful, low-cost base platform.

Details

Contact	Achieva
Phone	(02) 9742 3288
Online	www.achieva.com.au
Price	Motherboard, \$200; processor, \$130

Desktop systems

Dell Dimension XPS Gen 4



Based on the 1925XE chipset, Dell's Dimension XPS gaming system offers full support for Pentium 4 Extreme Edition processors.

The \$2,298 base model includes a 3.4GHz Pentium 4 processor, 512MB of dual-channel 533MHz DDR2 SDRAM, 80GB SATA hard disk, 48x CD-RW/DVD combo drive, Sound Blaster Audigy 2 ZS, 128MB Radeon X300 video card and Windows XP Home. A wireless keyboard and mouse are also bundled, but no monitor.

The only letdown for gamers is a lack of SLI support and the one-year warranty, but it's still quick and well-priced.

Details

Contact	Dell
Phone	1300 303 107
Online	www.dell.com.au
Price	\$2,298

Optima WorkPro D9S



The Optima WorkPro D9S is an excellent performer, has an extensive software suite and a three-year warranty. It employs

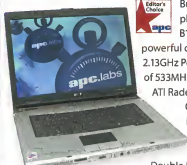
a 3.2GHz Pentium 4 processor, 120GB Seagate hard disk, 1GB of dual-channel DDR RAM, Double Layer DVD burner, 19in TFT display and a TPM chip for added security.

Details

Contact	Optima
Phone	(02) 9701 3777
Online	www.optima.com.au
Price	\$2,000

Notebooks

Acer Travelmate 8100



Built around the Sonoma platform, Acer's Travelmate B100 is packed with

powerful components. It has a 2.13GHz Pentium M processor, 1GB of 533MHz DDR2 SDRAM, and a 128MB ATI Radeon X700 video card.

Other standout features include a rich software bundle, a 15.4in wide-screen XGA screen, 80GB hard disk and

Double Layer DVD burner. Throw in Intel's tri-band PRO/Wireless 2915ABG adaptor, Gigabit LAN and Bluetooth, and you've got the ultimate blend of power, connectivity and portability.

Details

Contact	Acer
Phone	www.acer.com.au
Online	1300 366 567
Price	\$4,449

Acer Aspire 1690



The Acer Aspire 1690 features a 1.6GHz Pentium M processor, a 15in wide-screen display running at 1,280 x 800 pixels, Double Layer DVD±RW drive and 60GB hard disk. The base RAM is meagre at 256MB, but you can always add more. At around 3kg, this machine doesn't feel like dead weight.

Details

Contact	Acer
Phone	1300 366 567
Online	www.acer.com.au
Price	\$2,699

Digital cameras

Nikon D70



The Nikon D70 offers a 6.1 megapixel CCD and 0.13 second shutter response time. It features a Nikkor F mount which accepts a wide range of Nikon lenses, including regular G or D AF-type SLR lenses. The 18–70mm lens bundled with the camera offers aperture ranges from f/3.5 to f/4.5.

The camera resembles an SLR and offers the same range of settings. Users have a choice of fully automatic or a range of scene modes. Bracketing and a selection of shooting modes are supported, including single frame, 3fps and a self-timer.

Details

Contact	Maxwell
Phone	(02) 8488 5200
Online	www.maxwell.com.au
Price	Body, \$1,999; D70/AF-S with 18–70mm DX lens, \$2,299

Olympus Camedia C-5060

The 5.1 megapixel C-5060 is hard to go past. The 27–110mm, 4x zoom lens offers a wide-angle and a super macro mode, and it's reasonably fast with an f/2.8 to f/4.8 aperture. A variety of shot, meter, focus, white balance, exposure and image file modes are also available.

Details

Contact	Olympus
Phone	1300 659 678
Online	www.olympus.com.au
Price	\$1,099

ADSL modem/routers

Billion BIPAC 7402



One of the new breed of super-fast ADSL2+ modems, the Billion packs the right combination of features with quick download speeds. You get a four-port switch, Wi-Fi (802.11b), firewall and VPN support.

Importantly, there are enough customisation options to adequately handle multiple PCs, software types and games. Home business users will appreciate the built-in encryption engine. The BIPAC 7402 averaged an awesome 2,020KB/s in short-range testing (1km), downloading a 635MB file in five minutes.



Details

Contact	PC Range
Phone	(08) 8322 9544
Online	www.pcrange.com.au
Price	\$239

Belkin F5D7630au4A

The F5D7630au4A is one of the best value all-in-one routers available today. Superb out-of-the-box functionality, SSID hiding, WPA-PSK and 128-bit WEP wireless security features are all offered. Sadly, there's no print server capability or line filter in the retail box.

Details

Contact	Belkin
Phone	1800 666 040
Online	www.belkin.com/au
Price	\$300

TFT screens

ViewSonic VP171b



In a crowded market, ViewSonic's VP171b TFT monitor stands out from the pack thanks to its consistent performance—brightness, contrast and greyscale are equally excellent.

It has a super-fast 8ms refresh rate, making the VP171b the perfect choice for frag-happy gamers. Multiple inputs, including one DVI and two VGA, allow the monitor to be hooked up to several PCs simultaneously. Switching between them is easy using the OSD.

Add a sturdy base that allows both left and right rotation, tilt and 90° pivot, and you have a monitor with something for everyone.

Details

Contact	ViewSonic
Phone	1800 880 818
Online	www.viewsonic.com.au
Price	\$549

CMV CT-720D



CMV's CT-720D is a stylish LCD monitor with above average image quality and a very bright screen, making it especially suitable for use in environments with lots of ambient light. An 8ms refresh rate and supplied 2.5W speakers make it an excellent value package for gamers.

Details

Contact	Impact Systems
Phone	(02) 9621 2999
Online	www.impactsystems.com.au
Price	\$425

Handhelds

HP iPAQ hx2750



HP recently released a bevy of new PDA products, and the pick of the bunch is the iPAQ hx2750 due to its outstanding array of features. Its small, gunmetal grey body measures 11.9 x 7.7 x 1.6cm (HWD), and weighs just under 165g.

This top dog in the world of handhelds sports an Intel PAXA270 processor clocked at 624MHz, with 128MB of RAM and 128MB of ROM.

The 240 x 320 pixel display is clear and bright, although it's also a potential point of complaint in the future. VGA resolutions are beginning to appear on handhelds, though there's not much software capable of taking full advantage of it yet.

Details

Contact	Hewlett-Packard
Phone	13 23 47
Online	www.hp.com.au
Price	\$899

palmOne LifeDrive



PalmOne's "Mobile Manager" product takes the tried and true PDA design and marries it to a 4GB hard drive. With a 320 x 480 pixel display, Wi-Fi, Bluetooth and 64MB of RAM, the LifeDrive provides storage capacity galore, plenty of features, and palmOne power in one small package.

Details

Contact	palmOne
Phone	www.palmone.com/au
Online	(02) 9844 5420
Price	\$899

External hard disks

Maxtor Shared Storage Drive



Designed to provide a central storage repository for a home network or small business, the Maxtor Shared Storage Drive is a comprehensive yet compact package. It's also exceptionally easy to install, with setup handled through a straightforward Web Interface. It even has a couple of USB 2.0 ports at the back for additional storage devices or USB printers.

There are two size alternatives — a 200GB

drive with an 8MB cache, or 300GB with 16MB cache. The drive runs a stripped-down Linux operating system developed by Maxtor and based on the 2.4 kernel.

Details

Contact	Maxtor Australia
Phone	(02) 9369 3662
Online	www.maxtor.com.au
Price	200GB, \$449; 300GB, \$549

Seagate 5GB Pocket Drive



Sometimes portability outweighs the convenience of having hundreds of gigabytes of storage space in an external drive.

Advances in miniature hard disks have led to Seagate's impressive 5GB Pocket Drive. The entire USB 2.0 unit measures 7cm in diameter so you can take it almost anywhere.

Details

Contact	Ingram Micro
Phone	(02) 9701 4500
Online	www.seagate-asia.com
Price	\$349

Internal hard disks

Maxtor DiamondMax 10 SATA



Maxtor's DiamondMax 10 line is the current performance leader for mainstream desktop drives. Each drive features a 16MB cache, 7,200rpm platter speed and support for Native Command Queuing (NCQ). NCQ allows the system to organise, and read and write on certain areas of the disk, reducing the seek time and optimising the path of the drive's read head.

Though NCQ isn't supported by older chipsets, anyone running an Intel 9xx-based or Nvidia nForce4 motherboard can take advantage of the server-grade technology. Gamers, video editors and performance enthusiasts will benefit most from this line, which allows users to build inexpensive, fast disk systems for mainstream desktops.

Details

Contact	Maxtor
Phone	(02) 9369 3662
Online	www.maxtor.com.au
Price	250GB, \$239; 300GB, \$299

Western Digital WD1600JB

If you're lagging behind and haven't opted for a system with support for Serial ATA drives yet, the best bet for adding extra storage to your machine is a Western Digital IDE drive. The JB line includes an 8MB cache, which speeds burst transfers of data. It's backed by a three-year warranty.

Details

Contact	Weston
Phone	(03) 9541 8888
Online	www.weston.com.au
Price	160GB, \$189

Optical drives

ASUS DRW-1608P



Fast and feature-packed is the best description for ASUS' DRW-1608P drive. Capable of 6x burning

Double Layer discs, this drive wrote

8.5GB of data in a touch under 19 minutes, at an average speed of 5.84x. It can also burn $\pm R$ discs at 16x. It's also worth noting that this was achieved with the standard 2.4x DL media rather than any specialised 6x discs.

The 1608P ships with Nero 6 OEM Suite 3 and Ulead DVD Movie

Factory 3 SE for basic authoring of DVD-Video. A very well-rounded offering and currently the fastest option for those focusing on Double Layer burning.

Details

Contact	ASUS
Phone	1300 278 788
Online	www.asus.com.au
Price	\$129

Gigabyte GO-W1616A



Gigabyte's GO-W1616A is capable of both 16x $\pm R$ and 4x

burning a reality for the masses. It doesn't skimp on the bundle either, with Nero 6 OEM Suite 3 and a black face-plate thrown in.

Details

Contact	Rectron
Phone	(03) 9561 6166
Online	www.rectron.com.au
Price	\$93.95

Printers

Fuji Xerox DocuPrint C525A



Super fast mono printing and brilliant colour make the C525A hard to beat as a replacement for an old mono unit. You get 64MB of memory and a 9,600 x 600 interpolated print resolution — some competitors can only claim 2,400 x 600.

The standard tray can handle 200 sheets, and you have the option to purchase 250- or 500-sheet trays if required. The two-line LCD means settings can be adjusted directly at the printer, and the directional controls are easy to use. It's a little noisy, but the levels are acceptable for most environments.

Details

Contact	Fuji Xerox
Phone	13 14 12
Online	www.fujixerox.com.au
Price	\$799

Canon LASER SHOT LBP-2410



A desktop colour laser at a price unheard of just two years ago. Print speeds are rated at 16ppm mono and 4ppm colour.

Hi-5CoA (Hi-Smart Compression Architecture) means it only needs 8MB of memory to store pages. Not the fastest, nor the best quality, but for the price it's a winner.

Details

Contact	Canon
Phone	1800 021 167
Online	www.canon.com.au
Price	\$699

Video cards

BFG GeForce 6600GT OC



BFG ships its GeForce 6600GT cards from the factory pre-overclocked, delivering a small but noticeable performance boost over competing cards. The software bundle is rudimentary, but the assumption is that gamers already have the titles they need. It comes with a DVI-to-VGA dongle, HDTV video cable and a copy of Nvidia's NVDVD 2.0 DVD player.

The GeForce 6600GT is a great performer for the price, and by upping the clock speeds, BFG has made it a card perfect for casual and hard-core gamers alike.

Details

Contact	XLink
Phone	(02) 9647 1549
Online	www.xlink.com.au
Price	\$399

Leadtek Winfast PX6600 GT THD 128MB

Fancy a card that offers good gaming performance and value? Leadtek's new card runs quietly and ships with a solid software package. The card includes 128MB of GDDR3 RAM, 128-bit memory bus, eight pixel pipelines and support for DirectX 9's Shader Model 3.

Details

Contact	Rectron
Phone	(03) 9561 6166
Online	www.rectron.com.au
Price	\$299

File sharing software

Azureus

Downloading huge files is a much less daunting task when using peer-to-peer applications, and BitTorrent has become the framework *du jour* for P2P distribution. However, the original client lacks many of the features that third-party programmers have come up with, and Azureus is the king of that heap. It's Java-based, offers a highly configurable interface and presents no barrier to full-speed torrent downloads. A plug-in system also allows you to add further functionality to the client, and a built-in tracker lets you seed your own torrents on the network.

For the curious, Azureus is capable of collating almost endless amounts of statistics and information on the download traffic graphs included.

Details

Contact	Azureus Team
Online	http://azureus.sourceforge.net
Price	Free or donation

eMule

eMule is part of the eDonkey 2000 (ED2K) and KAD networks, is fully open source and works a charm. The advantage of using eMule over torrents is its search functionality. And, unlike eDonkey, eMule maintains its own server list and updates it at each connection. Statistics, IRC and a user-to-user messaging system are also built in.

Details

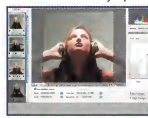
Contact	eMule Project
Online	www.emule-project.com
Price	Free or donation

Image management

Adobe Creative Suite 2



The latest version of Adobe's all-in-one design and layout offering, Creative Suite 2 aims to offer the tools needed for almost every aspect of the publishing process, as well as



provide a seamless and efficient workflow environment.

The package consists of Photoshop CS2, Illustrator CS2, InDesign CS2, Version Cue CS2, Adobe Bridge and Adobe Stock Photo. The Premium edition (\$2,209) also includes GoLive CS2 and Acrobat 7.0 Professional.

CS2 is more effective than CS1, with stronger integration between programs. Improved performance across the board makes it a winner.

Details

Contact	Adobe
Phone	1300 550 205
Online	www.adobe.com.au
Price	Standard, \$1,699

Google Picasa 2



Less a dedicated editor than a photo cataloging tool, Picasa offers basic editing functions including red-eye correction, straighten, or colour fixes. You even get the trademark "I'm Feeling Lucky" button for one-click fixes.

There's also an instant preview function and keywords can be used to tag images. What's more, it's free.

Details

Contact	Google
Online	www.picasa.com
Price	Free

NEW category Internet telephony software

Skype



By far the most popular IP telephony application, Skype shines thanks to its ease of use. Operating like an instant messaging program and working seamlessly through firewalls, Skype's standard configuration allows free calls to other users of its network. Using the SkypeOut service, it's possible to make calls to numbers on the public telephone network. Unfortunately, this costs, but rates are competitive with other telcos.

The SkypeIn service lets you buy a local phone number in any city around the world, allowing others to call your Skype account for the cost of a local call. The company also offers a voicemail service for a fee of €15 a year, or free with SkypeIn.

Details

Contact	Skype
Online	www.skype.com
Price	Standard configuration, free; SkypeOut, varies; SkypeIn, €30 per year; Skype Voicemail, €15 per year.

Xten X-Lite



This freeware IP telephony software is designed to work with any VoIP provider using the SIP standard. It requires more customisation than Skype — account and network settings must be configured manually, but this process offers a much greater degree of flexibility and is highly suited to those who love to tinker.

Details

Contact	Xten
Online	www.xten.com
Price	Free



8ms 17in LCD panels

Space-saving and easy on the eyes, LCD screens are suitable for home and office environments. **Tim Dean** looks at seven options.

There are plenty of benefits in upgrading to an LCD panel. The most immediate is the image quality — it's comparable with CRT, even exceeding it at very high resolutions. While the colour accuracy isn't sufficient for colour-sensitive design tasks yet, it's

great for most other common uses, such as office productivity and gaming.

In the past, LCD screens have been inferior to CRTs when displaying graphics and motion. One reason was the difficulty LCD technology had in reproducing smooth colour gradients,

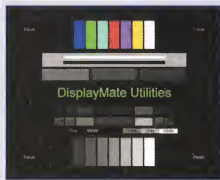
but the main problem was motion blurring. CRT monitors use phosphor dots, which rapidly fade to black when they're not actively lit. However, an LCD pixel takes longer to fade, which in turn causes streaking and blurring — a particular concern in gaming and video editing.

The latest generation of LCD panels attempts to remedy this problem by improving the response time (refresh rate) of the individual pixels. All the displays in this Labs Challenge have eight millisecond (8ms) response times, which refers to the time it takes a pixel to go from completely dark to fully lit and back to dark again. At 8ms, motion blur is almost undetectable, making these screens suitable not just for office tasks but for motion-intensive applications such as games and video.

When choosing an LCD monitor, one of the most important considerations is the pixel policy and warranty. Ideally, the pixel policy should be zero defect for the lifetime of the warranty. If not, the policy should cover zero defect for at least the first 30 days. This will ensure there are no dead or stuck pixels straight out of the factory, and reduces the likelihood of you ever having a pixel problem. Lastly, check the brightness and contrast levels yourself. All panels are not created equal, so you shouldn't take a manufacturer's word that its display is brighter than that of a rival.

How we tested

All monitors were connected to the same PC (a Pentium 4 2.8GHz CPU with 1GB of RAM, Nvidia GeForce 6600GT graphics card and Windows XP Professional) and assessed in the same environment, under the same lighting, with identical colour temperature settings.



Screen tests: the primary test pattern includes a range of elements to help spot obvious defects.

DisplayMate (www.displaymate.com) is a detailed calibration and diagnostic tool for scrutinising all aspects of a monitor's performance. Brightness and contrast were carefully evaluated, and a 256-step greyscale test was used to measure the graduation between shades from bright white to black. A completely black screen was used to detect any light leakage or bright patches.

Because pixel tracking is particularly important, a wide range of screens was used to detect flicker or noise at different intensity levels, banding, over- and under-saturation, viewable angle, video bandwidth, gamma, streaking, resolution and detail. Video playback and gaming were also tested to evaluate streaking and ghosting.

Finally, the overall package was taken into account, with features, design, dead pixel policy and warranty all contributing to a monitor's overall score.

Acer AL1751

It's almost impossible to produce an LCD panel that's perfect in every respect without spending thousands of dollars. However, Acer has done a good job, especially when it comes to the prickly areas of pixel tracking and noise, smooth greyscale and balance between brightness and contrast.

Many screens either oversaturate whites or can't distinguish between subtle shades of dark grey, but the AL1751 did a decent job with both. While it didn't handle either end of the spectrum as well as some other screens, it found a nice balance somewhere in between. However, the display is not without its faults.

It's not easy to increase the overall brightness of an LCD — the more powerful the backlight, the more stringent the manufacturing process needs to

be to ensure no light leaks around the edges of the screen. The AL1751 suffered from just this problem, with light leaking around the top and bottom.

The panel itself has a slim bezel, with OSD controls on the base. As the cables attach to the base instead of the back of the screen, this could cause some problems if you want to place the screen flush against a wall.

A three-year onsite warranty is offered, although the pixel policy of five non-conforming pixels isn't the most stringent in this comparison.

Overall, the AL1751 is a decent panel with a couple of minor image quality issues, but is let down by the price. The excellent ViewSonic VP171b (page 58) is \$150 cheaper and it pipped the AL1751 in terms of both quality and features.



Details

Contact	Acer
Phone	1300 366 567
Online	www.acer.com.au
Price	\$699
✓	Reasonable image quality.
✗	Some minor image quality issues; high price.
Verdict	★★★★☆

BenQ FP71E+

Despite the modest 300cd/m² luminance rating, the BenQ FP71E+ appeared very bright, which is both its strength and weakness. In testing, the FP71E+ demonstrated its ability to reproduce very pure and bright whites, although it fell down when it came to discriminating between subtle shades of white. Not even liberal adjustment of the contrast setting could clarify things — in fact, any contrast setting above 65% oversaturated the entire screen.

However, the screen performed very well when it came to dark greys, with even near-blacks clearly distinguishable from absolute black. Colours were bright and crisp, and besides the oversaturated whites, the greyscale was smooth and well-defined.

The FP71E+ was also one of few displays to present minimal light leakage around the edges

of the panel when set to a totally black screen. Uniformity was not as good with brighter images, with subtle dark patches around the top and bottom of the panel, although this isn't a critical problem.

This monitor sports the usual auto-calibration key, as well as a special test pattern intended to help the function deliver the best results. There are also four quick modes to help you make speedy adjustments of the global brightness and contrast for watching video or viewing text.

Unfortunately, the FP71E+ is let down by the lack of an onsite warranty, although the pixel policy includes a seven-day defect-free period, then two bright and/or three dark subpixels. If you invest in one, be sure to scrutinise it closely to pick up any problems.



Details

Contact	BenQ
Phone	(02) 9352 8800
Online	www.benq.com.au
Price	\$599
✓	High brightness and image clarity.
✗	Oversaturated whites; mediocre warranty.
Verdict	★★★★☆

CMV CT-720D

Sometimes a monitor manufacturer's listed specifications don't just correlate with reality. However, in the case of the CMV CT-720D, the panel's very high 450cd/m² level of brightness resulted in a brilliant picture. Furthermore, it delivered all this light without oversaturating bright whites.

However, there is a trade-off and the panel suffers from a corresponding deficit when it comes to very dark greys. This is particularly visible on a 256-step greyscale pattern, where you can see fine definition all the way up to 100% white, but the other end turns to total black at about 90% grey. This is still pretty good, but not perfect.

Apart from this, the CT-720D performed well across the other DisplayMate tests, with its only

other noticeable issue being some very slight flickering and noise in low intensity, coarse grey pixel patterns.

In terms of physical appearance, the CT-720D has an Apple-inspired white frame in place of the usual black and grey. The panel's bezel is also very wide, especially when compared with the likes of ViewSonic's VP171b (page 58) or the Acer AL1751 (page 56).

CMV offers an excellent three-year, onsite warranty as well as a 30-day period during which the monitor can be exchanged if it has any defects.

Overall, the CT-720D provides above average image quality and a very bright screen, making it suitable for environments with lots of ambient light.



Details

Contact	Impact Systems
Phone	(02) 9621 2999
Online	www.impactsystems.com.au
Price	\$425
✓	High brightness; good warranty; low price.
✗	Poor dark grey detail.
Verdict	★★★★☆

Hyundai ImageQuest L72S

Testing in the APC Labs revealed the Hyundai ImageQuest L72S to be an unusual monitor. On the one hand, it performed very well in an area where many other LCD monitors fell short, offering balanced bright white and dark grey detail. Many displays excel at one or the other, but often can't do both without either oversaturating the whites or leaving the subtle shades of grey indistinguishable from each other.

However, its overall performance was marred by a few significant issues. The first was the presence of four dark blemishes (around the size of five cent pieces) scattered around the screen. There was also very noticeable banding in the 256-step greyscale pattern — a tricky test for any monitor. The banding appeared at regular intervals, implying

that the display's electronics can't handle the subtle differences between shades of grey without taking shortcuts. There were also some minor colour tracking issues over some greys, which occurred when the red, green and blue subpixels don't output at the same intensity.

Unfortunately, these shortcomings outweighed the monitor's benefits and had an adverse impact on the screen's overall score.

Hyundai's dead pixel policy, which is based on the ISO13406-2 Class 2 guidelines, isn't as rigid as some others in this Labs Challenge. It allows for up to three dead or stuck pixels in a 5 x 5 cluster of pixels, or up to two 5 x 5 clusters of seven dead or stuck subpixels. Thankfully, Hyundai also offers a three-year, onsite warranty.



Details

Contact	Synnex
Phone	1300 100 100
Online	www.synnex.com.au
Price	\$439
✓	Low price.
✗	Some image quality issues.
Verdict	★★★★☆



Details

Contact	Philips
Phone	1300 651 993
Online	www.philips.com.au
Price	\$599

✓ Rotating base; USB hub.

✗ Image quality issues.

Verdict ★★★★★



Details

Contact	Samsung
Phone	1300 369 600
Online	www.samsung.com.au
Price	\$599

✓ Strong dark greys and text; flexible base; good warranty.

✗ Oversaturated whites; greyscale issues.

Verdict ★★★★★



Details

Contact	ViewSonic
Phone	1800 880 818
Online	www.viewsonic.com.au
Price	\$549

✓ Excellent image quality; flexible stand.

✗ Slight light leakage.

Verdict ★★★★★

Philips 170B6

Philips' 170B6 is a decent monitor, but a few image quality problems reduced its overall rating.

The first difficulty concerned brightness and contrast — a common issue for LCD panels. With some finetuning, the 170B6 did an excellent job of distinguishing subtle grey levels, but no amount of fiddling with the sensitive contrast control could compensate for the oversaturated whites at the other end of the brightness spectrum.

There was also some magenta ghosting around text, especially at smaller point sizes. This occurred because the pixel clock was slightly out of sync, although the auto adjustment gave different clock settings depending on what was displayed on the screen at the time. Even manual tuning couldn't eradicate the effect in all circumstances.

The 170B6 performed well in other tests, including the greyscale, colour patterns, and motion artefact tests — making it suitable for tasks where fine dark grey detail and motion response are important, such as gaming and video playback.

The Philips features a well-designed base, which takes up little desk real estate and also allows rotation through 125° left and right.

The three-year, return to base warranty is reasonably good, though of course onsite support is preferred. The Class 1 pixel policy (no pixel defects) definitely offers peace of mind.

Despite the clock irregularities and contrast problems, the Philips 170B6 is a reasonable panel. But there's no avoiding the fact that the BenQ and ViewSonic are not only better, they're cheaper too.

Samsung SyncMaster 713N

The Samsung SyncMaster 713N deserves credit for being one of the few screens in this roundup to exhibit negligible light leakage on a dark screen. It also performed very well when it came to distinguishing subtle shades of dark grey, although its abilities in this department were counterbalanced by a weakness with bright whites. Contrast is critical with LCD monitors, especially as brightness levels increase. Sadly, the 713N's impressive-sounding 600:1 contrast ratio wasn't enough to save it from oversaturated whites.

The only other problem apparent during testing was some noticeable banding in the 256-step greyscale pattern — a flaw exhibited by many LCD panels. This banding means the SyncMaster 713N

isn't ideal for detailed design applications. However, it's perfectly suitable for general productivity applications and gaming.

The 713N's flexible base is a welcome feature, and one which no other screen in this Labs Challenge shares. You can rotate and tilt it, as well as adjust the height and pivot it through 90° — especially handy if you work on documents or other media in portrait orientation.

The Samsung also comes with an excellent warranty comprising of a three-year onsite swap, plus a seven-day defect-free period as standard.

The 713N has some undeniably attractive features, but the image quality just isn't as good as the ViewSonic, BenQ or CMV models.

ViewSonic VP171b

While none of the monitors in this Labs Challenge posted a perfect score in the rigorous DisplayMate benchmark tests, the ViewSonic VP171b came close to perfection. It was the only display to deliver bright whites, balanced contrast and fine detail in the greyscale without major problems. This monitor also exhibited smooth graduations between shades in the 256-step greyscale and colour patterns.

The only noticeable shortcoming of the VP171b was some slight light leakage at the bottom of the screen, and a tiny amount along the top. This resulted in an increase in brightness along the bottom, with some washed-out colours in this area as a consequence.

The ViewSonic's stand occupies a little more desk real estate than others in the roundup. However, it also allows a wide range of motion, including left and right rotation and 90° pivot. The back of the screen hosts multiple inputs, with two VGA and one DVI-D. This allows the screen to be hooked up to multiple PCs, and you can switch between them using the OSD.

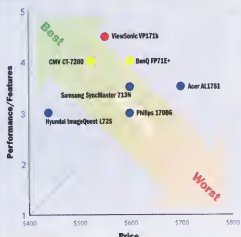
ViewSonic's pixel policy specifies that if five subpixels are either stuck or dead, the panel will be replaced, but it doesn't include a defect-free period. This is also backed up by a three-year, onsite replacement warranty.

This is an excellent screen at a value for money price — and a clear winner in this comparison.

8ms 17in LCD panel specifications

		★ Editor's Choice					
Manufacturer/model	CMV CT-720D	Hyundai ImageQuest L72S	ViewSonic VP171b	BenQ FP71E+	Phillips 170B6	Samsung SyncMaster 713N	Acer AL1751
Price	\$425	\$439	\$549	\$599	\$599	\$599	\$699
Native resolution (pixels)	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024
Maximum resolution (pixels)	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024
Brightness (cd/m ²)	450	300	300	300	250	300	300
Contrast ratio	500:1	700:1	500:1	500:1	500:1	600:1	700:1
Colour palette	16.7 million	16.2 million	16.2 million	16.2 million	16.2 million	16.2 million	16 million
Pixel pitch (mm)	0.26 x 0.26	0.26 x 0.26	0.26 x 0.26	0.26 x 0.26	0.26 x 0.26	0.26 x 0.26	0.26 x 0.26
Horizontal viewing angle	160°	150°	160°	140°	160°	160°	150°
Vertical viewing angle	140°	135°	160°	130°	140°	160°	135°
Inputs	VGA, DVI-D	VGA	VGA x2, DVI-D	VGA, DVI-D	VGA, DVI-D	VGA	VGA, DVI-D
Speakers	2.5W stereo	2W stereo	N/A	1W stereo	2W stereo	N/A	1.5W stereo
Auto adjust	✓	✓	✓	✓	✓	✓	✓
Screen coating	Anti-glare	Anti-glare	Anti-glare	Anti-glare polariser	Anti-glare polariser	Anti-glare	Anti-glare
Power supply	External	Internal	Internal	Internal	External	Internal	External
Dimensions inc. base (WHD, cm)	41.6 x 40.4 x 21.6	37.3 x 39.8 x 18.5	39.2 x 35 x 23.8	37.5 x 38.6 x 20.1	37.5 x 37.7 x 21	37 x 40.4 x 20	37.9 x 40 x 16.4
Tilt	0° to 20°	0° to 25°	-5° to 25°	-2° to 20°	-5° to 25°	-5° to 25°	-5° to 25°
Rotation	✗	✗	150°	✗	250°	✗	✗
Pivot (90° to portrait)	✗	✗	90°	✗	✗	90°	✗
Weight (kg)	3.5	3.8	6.5	4.7	4.8	5.8	5
Wall mountable	VESA	VESA	VESA	VESA	VESA	VESA	VESA
Warranty	3-year onsite	3-year onsite	3-year onsite pickup/drop off	3-year RTB	3-year RTB	3-year DigitalExpress onsite swap	3-year onsite
Pixel policy	30-day zero pixel, then 3 adjacent or 5 scattered pixels	ISO13406-2 Class 2	5 subpixels	7-day zero pixel, then 2 bright and/or 3 dark subpixels	Zero defects, ISO 13406-2 Class 1	7-day zero pixel, then 3 pixels and/or 0 in centre 8 x 8cm of screen	5 non-conforming pixels
Cables included	Power, VGA, DVI, audio	Power, VGA, audio	Power, VGA, DVI-D	Power, VGA, DVI, audio	Power, VGA, USB, audio	Power, VGA	Power, VGA, DVI, audio
Software	N/A	N/A	PivotPro	Easy Auto Adjustment	FP Adjust software	MagicTune, Pivot software	N/A
Benchmarks							
DisplayMate (out of 10)	6.57	5.83	6.90	6.92	6.71	6.45	6.57

apc price-to-performance ratio



It's not easy to manufacture an affordable LCD monitor that performs well across the board, yet that's what ViewSonic achieved with the VP171b. Its most impressive achievement is consistent performance across the board, especially when it comes to brightness, contrast and smooth greyscale — areas where most LCD screens struggle. This makes the ViewSonic an ideal screen for graphics professionals and general office use. Flexibility, digital and dual analog inputs, and a base that allows rotation, tilt and 90° pivot, make it a monitor with something for everyone.

One surprise performer was the CMV CT-720D. It offers high brightness



and impressive overall performance in the uncompromising DisplayMate benchmark, and delivers it in a stylish package. It's also the cheapest screen here, making it excellent value.



Media centre PCs

Media centre PCs continue to evolve, but are they ready for the living room? *Tim Dean* screen tests six potential stars.

How we tested

The first part of the assessment focused on the media centre experience. Each system was used to play music and DVDs, as well as broadcast and record TV. Features such as digital TV support and the presence of an EPG were noted, along with the quality of video playback.

Every PC in this roundup was benchmarked using PCMark04, which includes audio conversion, WMV and DivX video compression tests, all of which are relevant to MCE's core functions. Tests were also run under 3DMark03 to evaluate gaming abilities.

Other factors considered included TV tuners, storage capacity, case design and warranty, and whether cables were supplied.

Many of the first media centre PCs were intended to be nothing more than entertainment-enhanced systems for the study, with the Windows XP Media Center Edition (MCE) operating system providing access to TV and PVR functionality along with the usual PC applications and games.

But the living room is the media centre's ultimate testing ground, with many vendors rushing to develop new form factors which can live alongside a TV. The criteria for this Labs Challenge specifically called for media centres without monitors that are tailored to a lounge room environment. Keyboards and mice were optional.

Personal video recording (PVR) functionality is at the core of the MCE operating system, and a good media centre should focus on features that make the most of this. It should have dual tuners, preferably digital, plenty of storage space and an Electronic Program Guide (EPG).

DESIGN

Macros designed, PCs aren't normally noted for their slick design and intuitive operation, but these are the essential qualities for a living room media centre PC. The systems need to be easy to set up without extensive PC know-how, and have form factors that integrate seamlessly into the living room environment, which means sporting all the requisite connectors for audiovisual equipment.

They also need to be ultra-quiet — fans humming and drives crunching can be very distracting during hushed scenes.

TELEVISION

A media centre's essential function is receiving television broadcasts, either for immediate viewing or recording them to disk for later playback. Earlier incarnations of the media centre typically came with a single analog TV tuner, but it seems a waste not to utilise all the power and potential of PC hardware and the MCE OS with dual tuners, preferably digital.

Unfortunately, the release of an Australian EPG continues to be delayed because of copyright issues, although some vendors have resorted to third-party versions as an interim measure.

STORAGE

When it comes to storage capacity, it's more useful to think in terms of the number of hours of recorded television rather than gigabytes.

As a rule of thumb, MCE's "Best" setting uses about 2.7GB of disk space for one hour of viewing, and the "Better" setting consumes approximately 2GB an hour. The minimum capacity of your system should be 140GB, or around 52 hours at Best quality. However, 280GB, or 103 hours in the same mode, will give you plenty of elbow room.

In addition, a DVD burner is a good investment as it allows you to archive programs for delayed or repeated viewing. It should ideally support a range of formats, including Double Layer media, for the highest possible storage capacity.



Details

Contact	Acer
Phone	1300 366 567
Online	www.acer.com.au
Price	Model reviewed, \$2,300
	Balanced specification; wireless keyboard and mouse.
	Single analog tuner; large ugly case; lacks EPG.
Verdict	★★★★☆

Acer Aspire T620 AT 087 Media Center Edition

Acer has gone for a conventional PC look with its Aspire T620 — it's one of two tower cases in this Labs Challenge (the other being the Pioneer Dream PC 64, page 61). If you're concerned about living room aesthetics, look elsewhere.

Inside the case, the T620 is outfitted nicely — with one glaring exception. In these days of digital television, where dual tuners are quickly becoming the norm, the Aspire T620's solitary analog tuner is inadequate. Its image quality was noticeably inferior to standard definition (SD) digital, and there was also a slight synching issue between video and audio.

The T620 fared a bit better in the storage stakes, with a decent 200GB drive which should provide approximately 75 hours of recording in

Best mode, or 100 hours at the Better setting. This is backed up by a Double Layer DVD drive for archiving material.

Unlike the other systems in this comparison, the T620 includes a wireless keyboard and mouse. Although it would be nice if such peripherals were redundant on media centre PCs, it's comforting to have them handy in case of emergencies. It also opens up the possibility of Web browsing and using other Windows applications — although you'll have to squint at your telly when doing so.

Acer's Aspire T620 is a reasonable choice if you're looking for a general home PC with the bonus of MCE functionality. However, if your living room experience comes first, there are several better options available.

Altech Maestro Pro

Unlike Altech's other media centre PCs, the Maestro Pro doesn't come in a small form factor case. In fact, the case is enormous. However, it does have one feature that sets it apart from the crowd: an EPG.

Given that one of the primary features of MCE is its PVR functionality, an EPG is pivotal to realising its potential. The EPG allows you to browse through seven days' worth of programming. When you see something you like, you can schedule the media centre to record a single broadcast, or even an entire series whenever it's shown, just by selecting its title.

You can search by genre, such as comedy or documentary, and pick out the choice shows of the week. This allows the Maestro Pro to function as a PVR should — detaching you from the time dependence of television so you can watch what

you want, when you want. As an added bonus, you can skip through the ads.

Besides the EPG, the Maestro also sports some impressive features. While the chassis is huge, its looks suit the living room. Twin SD digital tuners provide a crisp picture, and a range of audio and video outputs also feature.

Perhaps the only disappointment is the single 160GB hard drive which records just 60 hours in Best mode, or 80 hours at the Better setting. Most of the other units on the market have 200GB or more, and at this price point you'd expect better.

If television is your priority, the Maestro Pro beats out the competition. While it could do with more storage space, and the price is relatively high, it excels as a media centre.



Details

Contact	Altech Computers
Phone	(02) 9735 5655
Online	www.altech.com.au
Price	\$3,499
✓	Fully functional EPG; twin digital tuners.
✗	Large case; high price; below average storage.
Verdict	★★★★☆

Emagen Digital Home M400

Despite claims that Windows XP Media Center Edition wouldn't support digital television, most vendors have found workarounds to this limitation. Along the way they have relegated analog technology firmly to the 20th century, where it belongs. Following this trend, the Digital Home M400 packs dual DVICO Fusion HD/SD digital tuners in PCI form to produce DVD-quality TV broadcasts.

Emagen also ensures that storage isn't an issue by squeezing in two 200GB drives. The combined storage space should provide a staggering 200 hours of recording at the Better setting, and close to 150 hours in Best mode.

Unfortunately, the Digital Home M400 lacks an EPG — if it had one, it would be the undisputed

winner in this Labs Challenge. However, to make up for this shortcoming, Gigabit Ethernet and 802.11a/b/g connectivity are provided along with a broad range of audio and video connectors, including component video.

The chassis is large, black and heavy, but in tune with the current style in home theatre components. Two panels on the front face flip down to reveal a Pioneer multifunction DVD burner and card reader.

One big advantage the Emagen has over the competition is its comparatively modest price tag. While the Altech Maestro Pro includes the desirable EPG, it has less storage space and costs over \$1,000 more. If you can live without an EPG, the Digital Home M400 is the best choice.



Details

Contact	Emagen
Phone	1300 880 070
Online	www.emagen.com.au
Price	Model reviewed, \$2,299
✓	Dual HD/SD digital tuners; plenty of storage; good value.
✗	Large chassis; lacks EPG.
Verdict	★★★★☆

Pioneer Dream PC 64

The diminutive Pioneer Dream PC 64 is a glance at the shape of things to come, although there are a few areas in which it falls short by today's standards.

Currently, the majority of media centres are based around desktop PC technology, but some vendors have realised that this doesn't quite suit the living room. When taking size, heat, noise and power consumption into consideration, it makes sense to use notebook technology, as the Dream PC 64 does.

The chassis itself is significantly smaller than the other systems in this Labs Challenge. Size has been kept to a minimum with an external power supply, a Pioneer nForce 3 motherboard, notebook DVD and hard disk drives.

The case also employs clever heat pipes with fan-cooled copper vanes, and a variable-speed main

fan to keep the system as cool and quiet as possible. This made the Dream PC the quietest system tested.

The downside of this particular form factor is that both of the digital TV tuners are external USB units, which makes them a bit fiddly and messy. The notebook hard drive is also a tiny 80GB, providing only 29 hours of recording time in Best mode and 40 hours at the Better setting.

Oddly, while the Dream PC 64 came second last in PCMark04 with a score of 3,966, it managed 9,737 in 3DMark03 — the top result in this roundup by a considerable margin — thanks to its Radeon X800 Pro graphics card.

Despite the storage capacity being a little low, the Dream PC 64 is a good choice if you're looking for a small, unobtrusive unit for your living room.



Details

Contact	Pioneer Computers
Phone	(02) 9690 2888
Online	www.pioneercomputers.com.au
Price	\$2,499
✓	Small and slick form factor; quiet.
✗	External TV tuners; low storage capacity; lacks EPG.
Verdict	★★★★☆



Details

Contact	Pioneer Computers
Phone	(02) 9690 2888
Online	www.pioneercomputers.com.au
Price	\$2,999
✓	Dual digital tuners; decent storage.
✗	Large chassis; lacks EPG.
Verdict	★★★★☆



Dev

Contact	Toshiba
Phone	13 30 70
Online	www.toshiba.com.au
Price	\$5,999
✓	Excellent screen; plenty of features.
✗	Massive; expensive; analog tuner; lacks EPG.
Verdict	★★★★☆

Pioneer DreamVision Power PC

In stark contrast to the Pioneer Dream PC 64, the DreamVision Power PC is an enormous black beast of a machine, with a characteristic (and perpetual) cooling fan hum and all the technology the company could pack into the case.

The chassis features flip-down front panels that expose the DVD drive, a card reader and a host of ports. All other connectors are found at the rear, including S-Video, composite and optical audio.

As its name suggests, the Power PC is not short of grunt, with a 2.4GHz Athlon 64 processor backed up by 2GB of dual channel RAM. You might question the need for all these gigahertz and gigabytes, but they don't go astray.

Its TV tuner arrangement is unique: the Pioneer sports an internal PCI DreamVision digital HD/SD

tuner, along with an analog tuner in external USB form. For the sake of simplicity and tidiness, dual internal tuners would have been preferable.

Storage is well catered for, with the 250GB hard disk giving around 125 hours of recording at the Better setting, and 92 hours in Best mode. A Pioneer multi-format DVD burner is also included. Networking is well handled thanks to dual Gigabit Ethernet, 802.11g and Bluetooth.

One disappointing feature is the long boot up time, which is due to the third-party SATA BIOS.

Overall, the Power PC doesn't have any major flaws, and covers most of the bases well (except the EPG). The price is also quite reasonable, but you get more features for less outlay with the Emagen Digital Home M400.

Toshiba Qosmio G20

The Qosmio is a unique proposition — a fully functional home entertainment system as well as a full-featured desktop replacement notebook. This gives it flexibility but also means it's a hybrid machine with corresponding compromises.

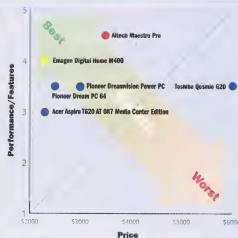
Thanks to the 17in wide-screen display, the G20 is huge. However, the screen itself is top quality: two lamps make it impressively bright and the anti-glare coating means the picture remains clear in a range of environments.

There are plenty of video options, with VGA, S-Video, composite, and component outputs. Audio isn't neglected either, with standard 3.5mm ports and optical output, and built-in Harman/Kardon speakers when running solo.

Toshiba has also included plenty of interface options, including touch-sensitive quick launch buttons, along with a volume dial next to the keyboard. There's also a proprietary remote control and comprehensive software bundle. Storage is handled by dual 80GB drives, giving a combined recording time of around 60 hours at Best quality and 80 hours at the Better setting.

Disappointingly, the Qosmio only has a single analog tuner. Given its specifications and price, dual digital tuners would be expected. The other drawback to the Qosmio is the price. For \$5,999, you could buy a well-equipped Centrino notebook along with the Emagen Digital Home M400 and still have change to spare.

apc price-to-performance ratio



An ideal media centre PC should have excellent television capabilities (such as dual digital tuners), plenty of storage capacity, and an EPG. It should also suit the living room environment, have all the requisite AV connectors, a DVD burner and plenty of horsepower.

While no single PC nailed everything perfectly, the Altech Maestro Pro managed to draw a slim lead over the competition thanks to its EPG. In good conscience, the Editor's Choice award couldn't be given to a system without one.



Emagen's Digital Home M400 was a very close second. Although it lacks an EPG, it has dual HD/SD tuners, plenty of storage, and is more than \$1,000 cheaper than the Maestro Pro.

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Media centre specifications

	★ Editor's Choice					
Model/vendor	Acer Aspire T620 AT 867 Media Center Edition	Emagen Digital Home M400	Pioneer Dream PC64	Pioneer DreamVision Power PC	Altec Maestro Pro	Toshiba Qosmio G20
Price	\$2,300	\$2,299	\$2,499	\$2,999	\$3,499	\$5,999
Warranty	1 year, onsite	1 year, onsite	1 year onsite, 3 years labour	1 year onsite, 3 years labour	1 year, RTB	1 year, RTB (pick up & return)
Dimensions (WHD, cm)	18 x 37 x 42	42 x 16.5 x 41	8.5 x 24.5 x 35.5	42 x 43.5 x 13.5	43.5 x 16 x 40.7	40.6 x 4.3 x 28.5
CPU	Pentium 4 540 3.2GHz	Athlon 64 3000+ 2GHz	Athlon 64 3000+ 2GHz	AMD Athlon 64 3800+ 2.4GHz	Pentium 4 640 3.2GHz	Intel Pentium M 760 2GHz
Motherboard	Intel 915P	ASUS A8E Deluxe	Pioneer nForce 3	MSI K8N	ABIT AGB 915P	Toshiba
RAM (as tested)	512MB PC3200	1GB DDR400 dual channel	1GB DDR400	2GB DDR400 dual channel	1GB DDR400 dual channel	1GB DDR2
Graphics card	ATI Radeon X800 Pro	Nvidia GeForce 6600 GT	ATI Radeon X800 Pro	ATI Radeon X700	Nvidia GeForce 6600	Nvidia GeForce FX Go 6600
Graphics memory	128MB	128MB	256MB	128MB	128MB	128MB
Video outputs	S-Video, composite, VGA, DVI	S-Video, composite, VGA, DVI, component	VGA, DVI, S-Video, composite	S-Video, composite, VGA, DVI	VGA, DVI, S-Video, composite	VGA, S-Video, composite, component
Video inputs	S-Video, composite	S-Video	S-Video, composite	S-Video, composite	N/A	S-Video, composite
TV tuner	Hauptpage TV-PVR	DVCD FusionHDTV DVB-T Plus x2	DreamVision Digital USB x2	DreamVision Digital PCI x1, USB x1	Hauptpage NOVA-T-MCE x2	Toshiba WW
TV type	Analog	HD/SD digital	HD/SD digital	HD/SD digital	SD digital	Analog
Soundcard	Integrated Realtek ALC880	Integrated 7.1	Integrated Realtek ALC655	Integrated Realtek ALC655	Integrated 7.1	AC'97 with SRS TruSurround
Audio inputs/outputs	2x mic, line in/out	Line in/out, S/PDIF	Line in/out, S/PDIF	Line in/out, S/PDIF	Line in/out, optical in/out	Mic, headphones, line in/out S/PDIF
Hard disk and capacity	Seagate 200GB SATA	Western Digital WD2000JD 200GB x2	Hitachi Travelstar BOGB	Western Digital 250MB	Seagate 160GB	Toshiba BOGB SATA x2
Optical drive/s	Optonite 16x DVD±RW Double Layer	Pioneer DVR-109BK 16x DVD±RW	Toscorp slim DVD-R/RW	Pioneer DVD±RW Double Layer	Samsung DVD±RW Double Layer	Toshiba DVD SuperMulti DVD±RW Double Layer
Floppy disk drive	✗	✗	✗	✓	✗	✗
3.5in bays free	2	2	✗	2	4	✗
5.25in bays free	1	2	✗	1	1	✗
Card reader	SD, MMC, xD, SM, CF, MS	SD, CF, MMC, SM, Memory Stick	SD, CF, MMC, SM, Memory Stick	SD, CF, MMC, SM, Memory Stick	✗	SD, MS, MMC, xD
USB ports	3x front, 4x rear	2x front, 4x rear	4x front, 2x rear	2x front, 6x rear	2x front, 4x rear	2x rear, 2x left
PS/2 ports	2x rear	2x rear	2x rear	2x rear	2x rear	✗
FireWire	✗	1x front, 1x rear	1x front, 1x rear	1x front, 1x rear	1x front	1x right
Modem	56k internal	✗	✗	✗	✗	56k V.92 internal
Network	10/100 Ethernet	Gigabit Ethernet, 802.11a/b/g	10/100 Ethernet	Gigabit Ethernet x2, 802.11g, Bluetooth	Gigabit Ethernet	10/100 Ethernet, 802.11a/b/g, Bluetooth
Keyboard	Wireless USB multimedia keyboard	✗	✗	✗	✗	B5 key
Mouse	Wireless USB multimedia mouse	✗	✗	✗	✗	TouchPad
Software	See footnote*	✗	CyberLink PowerDVD, Nero Burning Suite	CyberLink PowerDVD, Nero Burning Suite	Nvidia decoder	See footnote**
Electronic Program Guide	✗	✗	✗	✗	✓	✗
Extras (cables etc.)	✗	Composite, S-Video, composite-S-Video adaptor, audio	Composite, S-Video, composite-S-Video adaptor, audio	Composite, S-Video, composite-S-Video adaptor, audio	✗	Composite, S-Video, composite-S-Video adaptor, audio
Other features	Microsoft remote control, two piece stereo speakers	Microsoft remote control	Microsoft remote control	Microsoft remote control	Microsoft remote control	17in wide-screen display, PC Card slot, multifunction IR remote, CD/DVD/TV control buttons, IR port
Benchmarks						
PCMark04	4,714	3,914	3,966	4,631	4,819	4,050
3DMark03	3,181	8,038	9,737	7,022	4,717	6,133

* Acer software bundle: Norton AntiVirus 2004, Adobe Reader 6.0, Acer Resource CD, CyberLink PowerDVD, NDI CD-Maker Gold, Microsoft games pack (Age of Mythology, Links 2003, Flight Simulator 2004), Microsoft Works B.O., Webster's Encyclopedia. ** Toshiba software bundle: Microsoft OneNote 2003, Sonic RecordNow! Basic, InterVideo WinDVD Creator 2 Platinum, Norton AntiVirus 2005, Toshiba Zooming Utility, ConfigFree, Express Media Player, Power Saver, RAID Utility, Bluetooth Monitor 2.0, Assist, Speech System, Picture Enhancement Utility, Touch and Launch, PC Diagnostic Tool, CD/DVD Drive Acoustic Silencer Diagnostic Tool.

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D-Link ADSL2+ Wireless Router
- DUB-AV300**
D-Link Video Converter
- DWL-G120**
D-Link Wireless Adapter
- Wireless Multi-Function Printer**
- D-Link Wireless PC**

LOUNGE

- DSM-320**
D-Link Wireless Media Player
- DVC-1000**
D-Link Video Conference Camera
- DWL-G6810**
D-Link Ethernet to Wireless Adapter
- Z-5500**
Logitech Speakers
- Large Format LCD TV**

BEDROOM

- Quickcam®**
OptiLink Webcam
- DWL-G630**
D-Link Wireless LAN Cardbus Adapter
- D-Link USB Wireless Z-Port Hub**
- DVB-477**
D-Link USB Wireless Z-Port Hub
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D-Link Video Conference Camera
The D-Link DVC-1000 VideoPhone lets you bring your family, friends and colleagues

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DWL-G810

D-Link Ethernet to Wireless Adapter
The DWL-G810 converts any Ethernet-enabled device - such as game console, media set-top box, printer or videophone - into an 802.11g wire-

less device. The DWL-G810 is ideal for a video game console, allowing you to wirelessly connect to a broadband Internet connection for a better multi-player online gaming experience. You can also use the DWL-G810 Wireless Bridge to add a wireless connection to any Ethernet-enabled printer.

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D-Link is offering APC readers the chance to win the Wireless Media Player featured in the lounge room (opposite page).

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- Perform standard testing



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This package is ideal for a network that needs more than 2 computers networked and/or extra printers, wireless or wired routers, videophone or a gaming console to be added.

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- Or connect an additional printer
- Or connect a D-Link Wireless Access Point or Router
- Or connect a D-Link Internet Video Camera or VideoPhone
- Or connect a gaming console



Future Pack

DIS-103

This package would suit the smallhome/office that would need additional devices in the future.

- Connect an additional PC (Desktop and/or laptop)
- Or connect an additional printer
- Or connect a D-Link Wireless Access Point or Router
- Or connect a D-Link Internet Video Camera or VideoPhone

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Digital home invasion

What's the point in having all the latest gadgets if they can't make your life easier? Nick Pece has a close encounter of the digital kind.

Automatic recording of TV shows when you're not in? Check. Cheap VoIP phone calls? Check. Adjusting the thermostat on the home air conditioner from the office? Check. Media centre PC, movies on demand, commodity Wi-Fi and Ethernet, high-speed broadband, data storage solutions, camcorder, digital camera, MP3 player, game console? Got them all, plus copious other gizmos and gadgets. The problem? They don't work together.

Even with all the toys and tools filling the homes of every self-respecting geek, true integration of these appliances is still a pipedream for all but the most dedicated. Sure, some may have replaced the old faithful VCR or DVD player with a PC for an entertainment hub, but how well does it integrate with the other digital devices that permeate these so-called "smart homes"?

The companies involved in conglomerates such as the Digital Living Networking Alliance (DLNA) and UPnP Forum have invested a great deal of time and money trying to get all the electronic devices in the home playing nicely. According to Intel, one of the

major contributors to the digital home alliances, the typical smart home is all desktop PC-based. Its vision is based around a single computer which branches to a number of external devices — the television and stereo in the lounge room, another computer for productivity, a games machine, digital media adaptors, plus discrete devices such as the Windows Media Center Extender (see APC July, page 88).

Advances towards this vision include the "10 foot user interface" on Windows Media Center and the PC remote control. What has failed to eventuate is actually making all these devices work together in a consistent and intuitive way. It will be a long time before the digital home, even for basic entertainment purposes, has the simplicity of inserting a tape into a VCR and hitting play.

Waiting for technology to permeate the empty spaces in the home could take a long while, but why wait? As long as the current limitations of the digital home are understood, there's no reason why a close approximation can't be made. Here's how APC did it, and the technology behind it.

What's inside

Digital home on a budget, page 70

With a few compromises, the digital home can be a reality for less than \$3,500.

No expenses spared, page 72

Money no object? APC has a killer system for you!

Digital visions, page 74

The digital home in theory and practice.

Thriller of four dreams, page 76

Give going to the flicks the flick with the ultimate home cinema.

Digital home shopping list, page 78

Don't leave home without it.

Digital home on a budget

Cutting-edge tech isn't cheap, but *Nick Race* shows how the digital home can be made a reality for less than \$3,500.

1 Wireless surround speakers

Installing an entertainment system with few permanent changes to the room or building is ideal — especially if you're renting. Using wireless rear speakers for the surround sound system makes this a cinch.

Product: Sony DAVS8500W Wireless Home Theatre System

Price: \$1,199

Online: www.sony.com.au

2 Big screen TV

A big TV, projector or large monitor is imperative for the optimum viewing experience, but you don't necessarily have to go with ultra-expensive plasma or LCD. With a basic home cinema setup, you can get away with using a standard three-plug RCA input without the extra expense of VGA, DVI or HDMI connectors. Unfortunately, this Sony TV isn't wide-screen, but it's big and it's cheap.

Product: Sony KV5W25M31 59cm FD Trinitron

Price: \$699

Online: www.sony.com.au

3 MIMO Wi-Fi access point

A Wi-Fi network isn't a network without a wired link. The point where the network connects to your ADSL-equipped phone line is good for a home network, as most access points include wired switches for higher bandwidth requirements. Choose Multiple Input, Multiple output (MIMO) to support high bandwidth Wi-Fi for high definition video.

Product: Linksys WRT54GX Wireless-G broadband router with SRX

Price: \$379

Online: www.linksys.com.au

Digital media meets DVD

One of the simplest ways to view digital media such as DivX movies and photos on your TV screen is via a compatible DVD player.

Most major manufacturers have yet to add digital media features to their DVD players, but lesser-known brands such as Zensonic, XMS and Shincos have quickly filled the demand.

Downloading movie files on your home PC, burning them to disc and then playing them on the digital media DVD player can be a lot easier and more reliable than setting up a network media player.

The Zensonic Z330 (www.zensonic.com.au) is a good choice for a simple,

inexpensive digital media DVD player. It sells for around \$130 and handles DivX, XviD, MPEG-4, VCD and more, along with pre-mastered DVDs.

However, a new breed of players are appearing which offer both network connectivity and the ability to play DivX and other digital media files directly from a burned DVD or CD.

The Zensonic Z500 (\$549, available October) is one such player. It's also Nero Digital-compatible, so you can compress your DVDs and home movies down to comparatively small Nero Digital MPEG-4 files on your PC and play them back on the Zensonic. It connects to your home

network to play files stored on other PCs using either its built-in 802.11g wireless or Gigabit Ethernet.

Shincos's SDP1720D portable DVD player (\$329; available from www.strathfield.com) is great for watching movies outside the lounge room. In addition to DVD-Video, it also plays DivX, XviD, MPEG-4 and other formats on burned DVDs, correctly preserving the aspect ratio of the original material on its 7in LCD screen.

There are no cables to connect and because it's a simple, purpose-built device, it's power-efficient and has up to 60 hours' battery life — much better than any laptop.

Dan Warne





4 Wi-Fi network music player

The key to the digital home is the ability to shunt data to where it's needed, rather than having to go to the source. If you just want to play MP3s in a different room to the PC where they're stored, a Wi-Fi network music player is a gem. Of course, a speaker setup or stereo is required for music playback, but these devices can get it there.

Product: Apple AirPort Express Base Station with iTunes

Price: \$199

Online: www.apple.com.au

5 NAS drive

Digital audio and video files are memory-hungry, and moving them off your PC can save money on upgrades. A NAS device can act as a file server for all your digital entertainment, and be taken with you when travelling.

Product: Maxtor Shared Storage Drive 200GB

Price: \$449

Online: www.maxtor.com

6 Network media player

A network-enabled DVD or media player is better suited to a lounge room than a PC and all its associated complex control mechanisms. Add a PC or network attached storage unit (NAS, see above) and you have the ideal solution. Choose a device that's Wi-Fi-enabled for quick setup. For maximum wireless performance, couple it with a MIMO wireless Ethernet bridge and plug it into the device's Ethernet port.

Product: Zensonic ZS00 Networked DVD Media Player (available October)

Price: \$549

Online: www.zenson.com.au

Let your PC sleep

A network media player that sits under a TV commonly requires the PC to be left on to stream digital media files to it. This is because the PC usually has to be running media server software supplied by the media player manufacturer.

However, network attached storage (NAS) units are starting to bridge the gap. These hard drive enclosures (or standalone units with USB 2.0 connections) allow you to connect a hard drive directly to a home network so you don't always have to leave your PC on.

To complete the solution, specialist software maker TwonkyVision (www.twonkyvision.com) has created media server software that runs on NAS boxes. The key is to buy a NAS box based on

Linux firmware, such as the Linksys NSLU2. TwonkyVision MediaServer software (€15) can then be run directly from the unit.

TwonkyVision MediaServer also comes in Windows, Linux and Mac OS X versions. It provides faster and more reliable media streaming over your home network than the software provided by network media player manufacturers.

A trial version and installation instructions are available for download from the TwonkyVision Web site.

Dan Warne

Plug and play: a Linux-based NAS box such as Linksys' NSLU2 allows you to connect a hard drive directly to a home network



No expense spared

Money no object in the pursuit of your digital home?

Nick Race has a killer system for you!



Technologies to watch

Until now, enthusiasts have made do with standard hi-fi and computer connectors to knock together home theatre setups.

However, new technologies are emerging which make high definition TV, video and sound more practical in the home.

If you really want to set up your home cinema environment properly, keep an eye on emerging technologies before shelling out for technologies that might be superseded in the near future.

HDMI: forget Scart, RCA, S-Video and all those confusing audio and video connectors.

High Definition Multimedia Interface (HDMI) is designed to replace them all with one small FireWire-like plug. The catch is the equipment on both ends has to be digital, so no CRT TVs. Although it's great news for owners of DVD players, LCD and plasma TVs, digital TV receivers and PVRs. It carries HD video, up to eight HD sound channels, and allows devices at either end to talk to each other and automatically configure themselves.

Cathode Ray Panel: Samsung's reinventing the CRT TV by developing a 76cm Cathode Ray Panel (CRP) that's less than 41cm deep, addressing one of the drawbacks of CRT TVs. A plasma TV of that size typically has a

depth of around 21cm, so there's still a way to go, but Samsung has priced CRPs at just US\$1,199. CRP is capable of 1,080-line interlaced, high definition output with substantially better brightness and contrast than either LCD or plasma.

802.11n: the next generation of home wireless networking, 802.11n uses MIMO technology to deliver real speeds of 100Mbit/s (802.11g's claim of 54Mbit/s was more like sub-20Mbit/s in real life). It's the first wireless networking standard to provide adequate speed for glitch-free wireless video streaming. Until the standard is ratified in 2006, you can buy "pre-N" proprietary versions, but they're

1 Media centre PC

The "10 foot interface" in Windows Media Center Edition makes controlling a PC from the couch feasible, while the ability to add more storage to your media centre when required is a boon.

Product:	HP Pavilion Media Center m7088a
Price:	\$2,999
Online:	www.hp.com.au

2 Gigabit Ethernet router with QoS

D-Link's new gaming router provides Gigabit Ethernet to all devices on a network, which is more than enough to stream high definition video and copy huge files fast. It's also designed to have enough processing grunt to offer proper Quality of Service (QoS) to ensure time-sensitive traffic flows smoothly.

Product:	D-Link DGL-4300 Wireless 108G Gaming Router
Price:	\$349.95
Online:	http://games.dlink.com

3 HD plasma, LCD or projector

You can view HDTV on any unit with a resolution above 1,024 x 768 — the only real question is the size of screen you want and your budget. A projector produces the largest image, but bulbs need to be replaced relatively often. LCD is excellent, but just not big enough for some. Plasma offers a good balance between the two.

Product:	Hitachi 42PD7800TA 42in plasma TV
Price:	\$5,999
Online:	www.hitachi.com.au

4 Media-enabled entertainment device

Kids big and small will also want to play games. The next generation of consoles from Microsoft and Sony (due next year) have media capabilities built in, so using the

console on a second TV adds network media playback functionality, or just good old DVD.

Product:	Microsoft Xbox 360
Price:	TBA
Online:	www.microsoft.com/games

5 Storage

Even tightly-compressed DivX and WMV files take up a lot of memory. Adding storage in the form of NAS boxes is an option, but a more flexible solution is to load a generic PC with more internal hard drives as required. Be sure to choose a big case and keep it cool.

Product:	Buy or build your own
Price:	\$1,000+

6 Portable media centre

One of the more attractive features of the digital home is the flexibility to switch a program from the TV in the lounge to a PC in the study or notebook in the bedroom. If you can't wait for Media Center Extenders later this year, pick up a Media Center-enabled notebook and get that flexibility now.

Product:	Toshiba Qosmio F10
Price:	\$4,999
Online:	www.toshiba.com.au

7 Speaker system

Having your home wired for sound is the next logical step. A central control point can be connected to the media centre or network media player, and pipe audio throughout the home. Cabling can be tricky, but it's worth a thought if building a new home. Bose is working on a wireless version.

Product:	Bose Lifestyle 48 DVD Home Entertainment System
Price:	\$7,999
Online:	www.bose.com.au

not guaranteed to be upgradeable to the 802.11n standard in the future.

UWB: home theatre makers are working on eliminating cables altogether with Ultra-Wideband (UWB) radio technology. UWB uses a very wide spectrum over a short distance to transmit audio and data signals at speeds of up to 500Mbit/s. But the technology is still some time away. **WMVHD:** movie studios have been slow to take up digital distribution, but the pieces are falling into place. Nobody has come close to cracking Windows Media Video 9 digital rights management, and the new Windows Media Video High Definition format allows movie studios to distribute

content in full 1,920 x 1,080 resolution. You'll need a powerful PC for this format — at least a 3GHz Pentium 4 and 512MB of RAM. The best digital media DVD players will be able to play back WMVHD, though, freeing your PC from decoding hell.

Upscaling DVD players: most HDTV users love the quality of TV transmissions, but find DVD playback lousy. That's because DVD content is recorded in standard definition 768 x 576 pixel format, and gets crudely upscaled to high resolution on your TV. New DVD players will smoothly upscale to give a faux HD appearance. Expect them within the next few months.

Dan Warne

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Digital visions

Microsoft has been particularly enthusiastic in embracing the digital home concept. The company has partnered with big guns such as Intel and HP to deliver a range of devices (all powered by Windows, naturally) capable of accessing digital entertainment on demand throughout the home, using wireless networks and simplified interfaces.

"This has been a great year [for] moving towards the digital lifestyle," Microsoft founder Bill Gates commented at January's CES in Las Vegas, a frequent platform for his technological predictions. "I'd say it's going even faster than we would have expected." Microsoft claims to be investing US\$6 billion a year in smart home research.

Despite Gates' optimism and deep pockets, the digital home remains largely out of reach for most people. One key reason is that PC technology isn't yet simple or reliable enough for most users. "Unless mainstream consumers can take a device out of the box and immediately begin enjoying its benefits, they'll leave the box on the retail shelf," noted Forrester analysts Ted Scadler and Charles Golvin.

Those problems are being eliminated



They're heereer! Microsoft, HP and Intel are going great guns to push the digital lifestyle.

but the message isn't being conveyed to consumers, as research company IDC pointed out in its own digital home overview: "While the industry has done a great job in terms of gradually improving the ease of use and working together to devise standards in the hope that all these different devices can speak a common language, the message has not been delivered properly."

Another delaying factor in digital home concepts has been Australia's relatively slow take-up of broadband. According to IDC, houses that have broadband are twice as likely to have home networking equipment, a prerequisite for most home initiatives.

Angus Kidman

To PVR or not to PVR?

Personal video recorders (PVRs), which record TV transmissions to a hard drive, promise a lot — not least the ability to record an entire TV series without manual programming. Until now, though, there's been no official Australian electronic program guide (EPG) to feed a VCR the information it needs to automatically schedule recordings based on show name. That's because the TV networks claim copyright over EPGs, and some don't want to give it away for free.

A third-party company, IceTV (www.icetv.info), has come up with a solution. It's created its own EPG service that doesn't infringe copyright, and sells access to it for \$3 per month. So far, it's supported by a wide range of PC recording applications, but only a single standalone PVR, the \$1,099 Topfield TF5000PVRt.

Another simple option for recording TV digitally is a DVD recorder. Woolworths recently ran a limited-time promotion where it sold a DVD recorder for less than \$300 to its grocery customers. Rick Ramsey, product development manager for Strathfield, predicts DVD recorders will drop in price to \$199 in coming months.

Eco visionista

A mix of existing PCs and operating systems, a length of pipe and a vacuum cleaner helped Meg Travers create a digital home environment without spending a fortune.

Travers' home, located just outside Perth, plays host to an ageing Tangerine iMac, two PowerBook notebooks, a recycled PC running Debian and acting as a server, and three wireless access points. The iMac has an Elgato EyeTV tuner and DVD burner for recording TV broadcasts, and runs the Darwin streaming server to allow those broadcasts to be viewed on the notebooks.

To send media further around the house, Travers connected one AirPort Express access point to a speaker switch box and then used cable to connect three separate sets of speakers. (Direct wireless connections to the speakers were an option, but the equipment is more expensive and the speeds aren't really up to scratch, she says.)

One set of speakers sits in a separate building, with the cables running through a

Technology sucks: so Meg used vacuum cleaner piping to run her cabling.

pipe. Feeding the cables through was more low-tech, involving a roll of gaffer tape and a vacuum cleaner. "I was sure it wasn't going to work, but it did," she laughs.

While Travers says an all-in-one device that allows direct TV playback would be nice, there's a major aesthetic challenge involved: "I'm still looking for a really attractive home entertainment PC."

Notably, none of the PCs within the environment run Windows, which Travers says has contributed to the system's stability. "I only have to reboot when I upgrade a component or install a critical patch."

So what advice would she offer to other people looking to build their own dream digital network? "Don't assume you have to buy new gear. Look at what you've got." In the near future, the iMac may be replaced by a more powerful G4 system — which Travers also plans to pick up second-hand.

Dan Warne





MEDIA CENTER SYSTEMS BY EMAGEN

DHS M200

The DHS M200 is designed for users who need a slim case profile. This unit can support upto 2 tuners and 2 hard drives.

AMD Athlon 64 3000+
MSI RS480M2 Motherboard
512GB PC3200 DDR SDRAM
Integrated ATI X300 Graphics
DVico DVB-T Lite Digital Tuner
160GB 7200rpm SATA HDD BMB Cache
16X Dual Layer DVD+/-RW Drive
240W ATX Power Supply
10/100 LAN, Firewire, SATA RAID
7.1 Channel Audio, Digital Out
Logitech LX500 Wireless Desktop
Microsoft Media Center Remote
Windows XP Media Center 2005
1 Year Onsite Warranty

\$1,449 Inc GST \$15.23 p/wk*

DHS M400

Packed with the latest technology, with plenty of room to add extra storage or optical drives, and extensive support for video input and output to suit any requirement.

AMD Athlon 64 3000+
Asus ABV-E Deluxe Motherboard
512MB PC3200 DDR SDRAM
128MB GeForce 6200 TC HDTV/DVI
Dual DVico DVT-T Plus Digital tuner
250GB 7200rpm SATA HDD
16X Dual Layer DVD+/-RW Drive
350W ATX Silent Power Supply
GbE LAN, Firewire, SATA RAID
7.1 Channel Audio, Digital Out
Logitech LX500 Wireless Desktop
Microsoft Media Center Remote
Windows XP Media Center 2005
1 Year Onsite Warranty

\$2,099 Inc GST \$22.15 p/wk*

DHS MEDIA SERVER

The DHS Media Server offers extraordinary flexibility as the ultimate source unit for your home theatre. With advanced features such as a TFT touchscreen, dual tuners, and support for over 1TB of storage, this is the perfect unit for the discerning user.

AMD Athlon 64 3500+
Asus ABV-E Deluxe Motherboard
1GB PC3200 DDR SDRAM
128MB GeForce 6200 TC HDTV/DVI
Dual DVico DVT-T Plus Digital tuner
Dual 200GB 7200rpm SATA HDD
16X Dual Layer DVD+/-RW Drive
350W ATX Silent Power Supply
GbE LAN, Firewire, SATA RAID
7.1 Channel Audio, Digital Out
Logitech LX500 Wireless Desktop
Microsoft Media Center Remote
Windows XP Media Center 2005
1 Year Onsite Warranty

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Theatre of your dreams

For most punters, the biggest restriction on building the ultimate home theatre system is money. Angus Kidman looks at what you can achieve when you want to get serious.

While every self-respecting geek dreams of having a dedicated room with perfect acoustics and the very latest equipment, just purchasing a decent projector is beyond most people's means. If you have a limitless budget, however, here are some options to consider.



Fantasy projection: the projector is the ultimate means of delivering images in home theatres.

ROOM TO VIEW

If you want to replicate the complete theatre experience at home, you could go for traditional cinema seating, or even ButtKicker seats (www.thebuttkicker.com) which vibrate with the action. Remember to make the room as large and as dark as possible to get the best out of your giant screen, and properly position your surround sound equipment for maximum effect. Consider building soundproofing technologies such as Acoustiblok (www.acoustiblok.com) into the walls to minimise ambient noise. Of course, that means you may need to build a whole new house.

FIBRE TO THE HOME

However large your DVD collection, it's nice to be able to access a range of online media directly from your new entertainment room. Emerging high-speed technologies such as ADSL2 offer reasonable grunt, but for a full-on digital experience, you'll need optic fibre direct to your home.

Your best bet for this is to move to Queensland. Really. Telstra is currently

running trials of fibre to the home at estates in Brisbane and the Gold Coast. Rival ISPs hope to access the kilometres of dark fibre already running all over the country, but given Telstra's reluctance to share even its copper network, money alone might not be enough to help you elsewhere.

THE ULTIMATE PROJECTOR

For that genuine cinema vibe, it's hard to beat a projector. If you've got a spare \$10,000 or so, there are plenty of projector companies willing to take your cash in return for a high-spec DLP model and useful accessories such as customised ceiling mounts.

FUTURISTIC DVDS

Even though the debate over what form next-generation DVD will take is still raging, home equipment manufacturers like to plan well in advance. As a result, prototype DVD players regularly appear on the market — in Japan anyway. Sweet-talk a friendly contact and see if you can get hold of the early models from Sony or JVC.

Of course, there aren't many movies you can watch on the new players, but that's the price you pay for being rich. Alternatively, you can indulge in a 400-DVD changer such as Sony's DVP-CX995V.



No accounting for taste: having the ultimate cinema setup in your own home means never having to explain your choice of movie.

HOME ENTERTAINMENT SERVER

Lurking in a concealed but airconditioned cupboard is the other essential component of your home entertainment network — a server dedicated to the storage of your precious movie and audio files.

While disk storage prices have fallen dramatically, you'll still need to set aside a few thousand dollars for the server, as well as several hundred for someone to configure it. Alternatively, you could pay a teenager to sit and rip all your favourite CDs and DVDs to the system, or to download your favourite 10,000 tracks from a commercial music provider.



Just hit shuffle: if a prototype from Japan takes the idea of early adoption too far, settle for this 400-DVD changer.

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Shopping list

To take the hassle out of choosing the prime components for your digital home, William Maher rounds up the best.



1 Altech Maestro Pro
RRP \$2,688
Seen online from \$2,230

BenQ DV3250
RRP \$2,799
Seen online from \$2,739



2 Maxtor DiamondMax 10 SATA
RRP \$239
Seen online from \$187



3 ViewSonic PJ400
RRP \$1,499
Not available at time of writing



4 Zenasonic Z400
RRP \$369
Seen online from \$235

D-Link DGL-4100
RRP \$299
Seen online from \$245



5 Netgear MP101 Wireless Digital Music Player
RRP \$229
Seen online from \$183.64

D-Link DGL-4300
RRP \$349.95
Seen online from \$302.01



1 Media centre PC

The winner of APC's media centre PC roundup (page 60), Altech's Maestro Pro stands out for its EPG, easy TV recording, and two digital TV tuners. The Emagen DHS M400 (\$2,299), with two 200GB drives and two digital tuners but no EPG, is also highly recommended.

2 LCD TV

This 81cm LCD TV from BenQ features a contrast ratio of 800:1 and a resolution of 1,366 x 768 in a 16:9 aspect ratio. The company is making a big deal of the fact that this means true edge-to-edge pictures rather than letterboxing — and all at a price point even lower than LG's 66cm model.

3 Hard drive

Building a Terabyte of server storage yourself is expensive, and sometimes the cheapest option is four 250GB drives. Maxtor's 250GB DiamondMax 10 SATA drive has a whopping 16MB cache and native command queuing. If your PC isn't SATA-compatible, try Seagate's Barracuda 7200.8 250GB device, seen online for \$210.

4 Projector

Many people just don't have the space to properly accommodate a projector beam, but ViewSonic's PJ400 creates a 100in (2.5m) viewing area in just three metres. It supports 1080i high definition digital signals with RGB and video, and a lamp-saving mode.

5 Network media video player

As well as crucial MPEG-4 video capability, the Zenasonic Z400 also has built-in 802.11g wireless and Ethernet. Digital audio output and remote control are nice touches.

6 Gigabit gaming router

Wired Ethernet is best for high bandwidth apps like video, and the D-Link DGL-4100 packs four auto-sensing Gigabit Ethernet ports, plus a 10/100 Fast Ethernet port. It's also set up for home gaming, with enough firewall, logging and dynamic routing features to cover the basics. If you don't need all this advanced functionality, try the Netgear GS605 5-Port Unmanaged Gigabit Switch (seen online for \$140).

7 Wireless music player

Want to stream music from PC to stereo? The Netgear MP101 handles MP3 and WMA files via wireless or Ethernet, and comes with a remote control. Preinstalled software finds your music and sorts playlists, and there's 64- and 128-bit WEP encryption for extra security.

8 Wireless gaming router

The D-Link DGL-4300 beats the pants off regular 10/100 home routers with its four-port Gigabit Ethernet switch. Wireless is taken care of via speed-boosted 108Mbit/s, plus 802.11b/g and a 5dBi detachable antenna. The firmware is upgradeable and D-Link claims the CPU can simultaneously handle file sharing, other Internet apps and multiplayer games.



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* Yields based on 20% coverage of page (5% of each colour - CMYK) at a 50% colour printing ratio. Excludes Paper. Includes 3 year onsite manufacturer's warranty. For more information on yields please call 1300 362 345.



Stop the rot

You've religiously backed up your data to disc. But at the moment of truth, you discover the information is completely unreadable.

Jeanne-Vida Douglas investigates this alarming phenomenon.

What can go wrong

- The bottom layer (substrata) contains the grooves to guide the reading and writing lasers. If it's too thin, the disc warps, increasing jitter and affecting data integrity.
- The organic dye layer containing the data is adversely affected by heat, light and moisture.
- The reflective layer consists of a fine lamina of silver, gold, or a mixture of the two. While both metals perform well initially, silver can oxidise, making it impossible for data to be read.
- Discs are encased in epoxy resin. The almost finished medium is then spun at high speed. If poorly handled, cracks can appear in the resin, allowing moisture and air to come in contact with the reflective layer, speeding up the oxidation process.

While researching his Doctorate of Philosophy on hierarchical intelligent systems at the University of Melbourne, Waratt Rattasiri began regularly backing up his data to recordable CD to guard against hard disk failure leaving him without access to his precious figures. But from the outset, Rattasiri experienced problems recording to the media.

"Sometimes, especially with cheap media, the burning process just stopped," he says. "I knew it was because of the media, not the PC, [since] it would work sometimes if I put in a different brand [of disc]. At other times, after I had successfully burned some cheap CDs, which were readable at that time [and] kept them in my CD book, they just became unreadable for no reason."

Sydneysider Zacha Rosen uses CD-R to archive graphics works, make his own music compilations, and record oral histories from his grandmother, which he records on MiniDisc and backs up on CD.

"It's very important material to me," says Rosen. "So I looked up how to store the CDs properly so that I still have access to it all in case something happens to the original."

Whatever form it takes, information stored on optical media is contained in a layer of organic dye trapped between a thin layer of reflective metal, and a substrata layer etched with a spiral groove just 0.5 microns wide (a single strand of hair is approximately 20 microns thick). Guided by the grooves, disc writers burn pockmarks into the

dye, thus capturing the digital information. When read by a CD player or drive, the pockmarks absorb the laser beam. The unburned areas allow the laser to pass through to the reflective layer, recreating the digital signal.

Similarly, recordable DVD technology relies on a reflective surface and a dye layer into which the data is burned. However, the tracks on a DVD±R are much closer together and the pockmarks burned into the dye are half the size of those on a CD. Due to the added complexity and finer resolution, more can go wrong in the writing and reading process and subsequent performance.

DON'T BELIEVE THE HYPE

Sales of recordable CDs hit the billion per year mark at the turn of the century and have continued to grow — market research group Understanding and Solutions currently estimates CD-R sales at just under 10 billion units annually. Between burn failure and media degradation, however, consumers could just as easily have picked up 9 billion coasters.

With 30 or so manufacturers vying for attention in a white-hot market, hyperbole often wins out in marketing material. TDK claims its entire CD-R range is "manufactured to last a lifetime". Verbatim says its DataLifePlus discs carry a lifetime warranty, promising 100 years of archival stability. Princo describes its CD-R media as ideal for library storage and personal medical records. But those who have burned and been burned know better.

"Advertising is never trustworthy since all manufacturers say their products are reliable and better than those of their competitors," Rattasiri believes. "Now I rely on word of mouth, Web forums

or a shop's recommendation, not on what the manufacturer says about the product."

TESTING TIMES

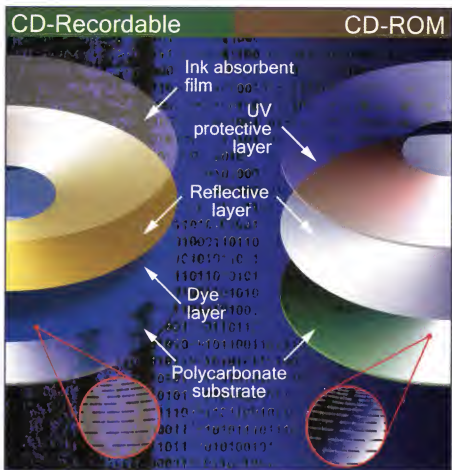
Alerted to the long-term corruption issues associated with optical media, Rosen began testing his older recordings. "Most of them were still okay, but one had a kind of crackling sound — similar to a badly burned CD," he explains. "I was aware of the degradation problems, but I was under the impression I'd been buying good quality media."

Kevin Bradley, manager of the National Library of Australia's Digital Preservation section, says people are surprised when they discover CD-R technology can be an unreliable storage and archiving medium, because it was initially marketed as a "perfect permanent carrier".

"The only way to reliably know the condition of a digital collection is constant and comprehensive testing," insists Bradley. "This can't be stated too strongly — no collection using CD-R as an archival carrier should be without a reliable CD tester."

Most standalone CD and DVD players have built-in error correction systems, which tolerate anywhere up to 220 block errors per second. However, optical drives don't have the same kind of error correcting, so those using CD-R to back up data need to be even more careful about the quality of the media and how it's stored.

The organic dyes used in recordable media have differing levels of stability — data may appear safely archived initially, but can corrupt or even disappear over time. The four



Layer upon layer: recordable media is made up of a combination of protective and absorbent laminas.

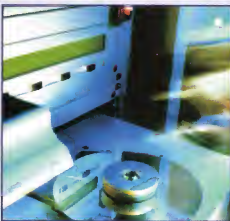
most common dye types (see "Discs tested", page 82) have different structures, but heat, humidity and light all affect the dyes to

differing degrees. Some media will last three years, some may last 300 years. The trick is in choosing the right ones. ▶

Damage control

Investing in a CD CATS analyser is way beyond the budget of most home users, but there are ways to test the integrity of data stored on optical media. A Google search returns a plethora of recordable CD and DVD integrity testing applications, and many optical drives come with their own software.

While such programs scan for a range of errors, they are only ever as good as the driver on which they depend, and are only able to test for errors once they have affected the data integrity. And none of these applications are capable of reliably measuring "jitter" — the minute variations in the positioning of the pockmarks burned into the organic dye layer. Although in itself not a fatal



CATs analysers are capable of testing CD-R/RWs that are unwritten, partially or completely written.

error, the presence of high jitter rates indicates the onset of block error, which ultimately renders discs unusable.

Serious home archivists wanting to get access to a CD CATS analyser can contract companies such as ProDisc, which run high-level tests capable of pointing to integrity problems with the media before any data is lost.

To ensure your data is still around in the long term, use the best quality media. Then make separate copies for access and archiving purposes. Last but not least, store master or archive copies in sturdy, light-proof cases and keep these in a temperature-controlled environment.

After all, if it's worth saving, it's worth saving well.

► Scientists believe that the process of dye destabilisation is accelerated where there are rapid fluctuations in light, ambient temperature and humidity. In one study conducted by the National Institute of Standards Technology in the US, a transparent dye (phthalocyanine) was found to be the most stable. Discs using blue cyanine dye performed well in light tests, but degraded under heat and humidity. Media using dark blue metalised azo dye showed significant losses in all tests.

DO IT YOURSELF

Testing data integrity on home-burned media isn't easy. You need equipment capable of accurately measuring pockmarks 0.5 microns wide and 0.85 microns long, in a dye layer just 0.1 microns thick, resting on a gold or silver reflective layer of about the same thickness. Since the acrylic layer protecting the dye is only 5 microns thick, any minor disturbance to any of these surfaces can result in a reduction in the integrity of the recorded data.

There are software packages available which perform scans through the CD drive, but these are only as good as the drives themselves, and not highly regarded among audio professionals or archivists.

To properly test CD-R media, you need a CD CATS analyser — which cost a prohibitive

US\$80,000. The CD CATS analyser tests data integrity according to 18 parameters, including jitter (the precision of each pockmark); block error rate (BLER), which picks up the number of blocks of data with at least one error; E22 errors, which are only barely correctable; and E32 errors, which simply render the data unreadable.

However, you can test the stability of different dyes at home. Simply take a range of different optical media and burn them all with the same data on the same drive on the same day. Find a nice sunny spot to hang them, then once a week, attempt to retrieve the data. In some cases, you can literally see the dye — and the data — fade away.

WHAT STANDARDS?

With no industry standards for disc quality, and vendors making all sorts of claims, choosing good quality media is a challenge. Bob McAnderson, sales and marketing manager at Grace Information Management, finds the lack of consistency particularly frustrating as his business depends on reliably storing other people's data.

Alarmed at the disparities between, and even within, different brands, McAnderson finally settled on ProDisc, a supplier which can provide a certain degree of quality control, albeit at a higher price.

"Everyone is under the impression that the media is cheap, but it depends on what you're storing. If you save 50 cents per disc but end up losing your archives, you haven't really saved anything," he observes.

At the National Library of Australia, Kevin Bradley has extensively tested CD-R media, but he won't reveal which brands he prefers.

"It's a touchy subject because the archivists want to say one thing, and the brands want to sell their product," Bradley says. "Even though I know my procedures are fairly accurate, I won't mention the brands."

Cliff Blackburn, an audio engineering consultant working in the film and television industry, is less guarded.

"As soon as CD-Rs began to be mass produced, the failure rate started to rise," Blackburn believes. "[Disc] manufacturers save money wherever they can to push the price down. They use cheaper dyes, cheaper material in the reflective layer and a thinner substrate, so they don't stay flat and you end up with problems in your disc player."

In an attempt to discover the best quality media, Blackburn commissioned a study which tested a series of brands for BLER, reflectivity and E22 errors. And unlike Kevin Bradley, he's happy to share the results (see box "Discs tested", below). [EITC](#)

Discs tested

Tired of patchy results with CD-R technology, Cliff Blackburn purchased 14 spindles of discs from different brands, gained access to a CD analyser, and put the media through its paces.

Blackburn measured for block error rate (BLER), E22 errors, reflectivity (which should be higher than 65%), and the weighted average window margin (WAWM), which combines 36 timing variables (including jitter) into a single value for rating.

Tests were conducted at the premises of archival disc manufacturer ProDisc using a CD-CATS analyser. Discs were all burned and tested within minutes of each other.

ProDisc managing director David Wickett advises that many brands change manufacturers, factory and production lines frequently, so a bad result in one test of one batch of media doesn't necessarily imply that a brand provides poor quality across the board. However, ProDisc uses only one manufacturer and a consistent "recipe" for its disc production.

Rank	CD-R brand	BLER average	BLER max	E22 max	Reflectivity	WAWM min	Surface colour	Dye type
1	ProDisc Premium White Printable	0.1	13	0	75	38.681	Silver with aqua tint	Phthalocyanine
2	BASF P4 Digital Audio	0.3	10	0	70	37.043	Pale blue	Cyanine
3	ProDisc Qub 80 Utility CD-R	1	25	0	73	37.066	Silver with green/yellowish tint	Modified phthalocyanine
4	That's CD-R 80TY 700MB RV	0.3	12	0	68	32.472	Pale green/blue	Cyanine
5	That's CD-R 80TY 700MB Taijo Yuden	0.9	19	0	68	30.172	Pale green/blue	Cyanine
6	HHB CD-R74 x1 > x16	0.6	27	2	66	39.95	Silver with green/yellowish tint	Modified phthalocyanine
7	Imation CD-R 700 MB 80 min x1 > x48	2.1	24	5	67	35.357	Silver with green/yellowish tint	Cyanine (unconfirmed)
8	Sony CD-R 700MB Supremas x1 > x40	2.8	26	0	70	34.102	Silver with pale blue/green tint	Cyanine (unconfirmed)
9	EMTEC CD-R 80 x1 > x16	3.5	25	0	67	14.304	Silver with green/yellowish tint	Cyanine (unconfirmed)
10	Laser 80min Premium Gold up to x40	9.3	42	0	68	17.32	Silver with green/yellowish tint	Cyanine (unconfirmed)
11	TDK 74min White Printable x1 > x16	33.2	510	0	69	31.903	Pale blue	Modified cyanine
12	Verbatim CD-R 80 x1 > x24	9.9	53	1	71	20.069	Mid blue	Super azo
13	Sony CD-R 700MB	378.6	100.9	2	67	-3.627	Aqua	Cyanine (unconfirmed)

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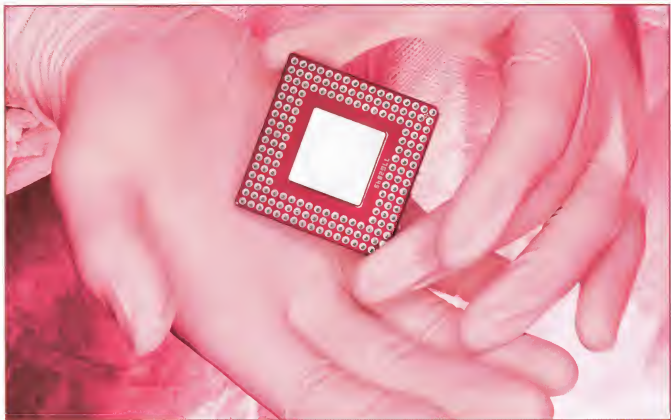
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Chipping away at Moore's Law

Today's CPUs have almost hit the performance wall. *Simon Sharwood* peeks in the labs of the world's biggest chipmakers to see what's next.

The worst Australian car ever made was the Holden Sunbird. Conceived in the oil crisis of the mid-'70s, the Sunbird took the body of the fabled Torana muscle car and, in the name of fuel economy, dropped a puny four cylinder engine under the bonnet. The result was an underpowered rolling joke that few drivers will forget, although most will keep trying.

The Sunbird analogy dovetails into CPU conundrums for chipmakers. Faced with shortages of electricity, cooling capacity and motherboard real estate, chipmakers have abandoned the industry's long commitment of building bigger, faster engines for computers. Their alternative is multicore processors, a technique that sees two or more modest engines placed beneath the hood in the hope that multiple engines will deliver better performance than one big, complex beast.

Faced with shortages of electricity, cooling capacity and motherboard real estate, chip makers have abandoned the industry's commitment to building bigger, faster engines for computers. The

alternative is multicore processors, a technique that sees two or more less-powerful engines combined in the hope they'll deliver better performance than one big, complex beast.

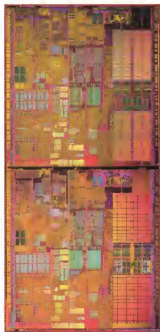
However, chipmakers already concede that multicore is not the ultimate answer to keeping pace with Moore's Law, the increasingly impractical prediction that the number of transistors on a chip will double around every two years.

HOT RODS

Ironically, it's the success of Moore's Law that's led the industry to the point where new technologies are needed to preserve it.

It's easy to forget that when the Pentium debuted in 1993, it sported less-than-sizzling clock speeds of around 60MHz from just 3.1 million transistors. Today, a Pentium 4 reaches clock speeds of up to 3.73GHz and can boast nearly 100 million transistors, while Itanium cracks the 100 million mark.

However, cramming all those components on to the semiconductor's die creates several problems.



Two cores are better than one: Intel Pentium Extreme Edition processor die.



From left to right: AMD's Athlon 64, Intel's Pentium Extreme Edition, Sun's Niagara chip working in mutual optimisation with Solaris 7.0.

One is heat. The more transistors you have, the more power a chip needs, and the more power the chip needs, the hotter it runs.

Size is another issue. Breathing space on the motherboard is necessary to ensure that components don't singe their neighbours, but chipmakers have responded by working on ever-smaller scales. Intel, AMD and IBM all make chips with elements as small as 90 nanometres, so they can pack more power into small spaces.

Once you pack transistors really close together, however, weird things start to happen. Instead of moving predictably, individual electrons jump about in ways that can make them hard to control. When that happens, computers become unreliable.

Multicore processors are the industry's technology of choice to get around this problem.

Simply put, multicore processors are two or more processors in one. Neither is a high performance screamer, but combined they deliver better performance by tackling heat, size and electron motion issues.

Pack transistors really close together and weird things start to happen

1+1=1 AND A BIT

However, multicore machines have some problems, foremost among them being the fact that one plus one does not equal two.

Most dual core machines deliver around 50% more computing power than a single core processor. Things only get worse as more cores are added. A quad-core machine doesn't deliver anywhere near four times the computing power of a single chip — it may not even double the power of a single CPU. Chipmakers envision eight- and 16-core chips too, but know they won't deliver 16 times the performance.

CPUs work by cycling through a queue of jobs. Some applications or processes are given priority thanks to initiatives like Intel's Hyper-Threading that let them prioritise some resources and shunt others backwards. But,

by and large, each job must wait its turn.

This isn't a huge problem in these days of 3GHz CPUs, since there are so many cycles available and they come up so often that a PC can process many applications serially and still appear to be working in parallel.

Even when there are problems, the CPU is probably not to blame. Slow components such as RAM or hard disks cause significant bottlenecks that are more often than not the culprit for poor performance.

The real inhibitor for multicore CPUs are OSes, which aren't yet designed to take advantage of these processor's capabilities.

"As soon as we cross a threshold of hardware performance, software guys start to take advantage of it," says AMD's chief technology officer, Fred Weber. "Consumers buy the hardware to get their hands on the software, and the hardware guys say: 'We can tune the CPU to do the job that software does today better than software can do it.' You get a virtuous circle of innovation."

Details of how the next version of Windows, codenamed Longhorn, will deal with multicore machines are sketchy,

although support is on the company's radar. Linux support is on the way too.

NIAGARA

For a more detailed vision of how multicore CPUs work, look at Sun's Solaris OS.

Sun is one of a handful of companies that designs its own CPUs and its own OS. It's a practice known as "mutual optimisation" as it sees each component tuned to interoperate with the other. Microsoft and Intel do this to some degree, but never quite achieve the same level of integration as Sun's products.

Sun's forthcoming Niagara chip shows how the integration works. Due later this year, Niagara features eight cores, each initially running at a modest 1.2GHz, with four processing threads. To the operating system, it will look like 32 processors are available.

The multicore compromise

Multicore CPUs will keep Moore's Law going and also keep PCs relatively cool. But according to Dell, they may not allow every PC to pack the full complement of hardware that most use today.

The company's Australian marketing business development manager, Jeff Morris, said a Dell gaming laptop sold only in Europe and the US shows why. The machine's original design used a Pentium 4, a chip expected to provide plenty of grunt for gamers. But the processor simply ran too hot, making it impossible for the company's engineering team to build a viable machine that wouldn't fry its own insides.

Dell then changed to a Pentium M, which increased the battery life and dropped the temperature to a point where it became possible to include a faster, larger and hotter graphics card.

"If you go down the multicore route and still want a 2kg notebook, you won't be able to get everything into it," says Morris. In the future, he believes that thinner, lighter notebooks may have specific functions, with components swapped in and out to create models that meet the performance demands of different applications.

However, Dell is also working on how to pack the new wave of components into the smallest possible space so that any compromise is slight. "Our server design teams are used to cooling components in the tight confines of a blade server," says Morris. "We can leverage that form factor into the PC."

But it's the OS itself that will unleash Niagara's power. "Under normal circumstances, a CPU does a little bit of work and then waits for memory refresh or something else to happen inside the machine," explains Sun's chief technology officer for Australia and New Zealand, Angus MacDonald. "People don't realise how much of a performance penalty that imposes."

► "The first 99 instructions can execute in milliseconds, but if you need to go to memory for the hundredth instruction, it can take an extra 300 milliseconds."

The combination of the Niagara chip and Solaris OS means that when this happens, the core handling the problem doesn't stop and wait for something to happen. "Rather than leave the processing core twiddling its thumbs, we put it to work on another thread," MacDonald explains. The operating system and Niagara work together to reassign work to available cores millions of times a minute to ensure that every available cycle is used.

"We get higher throughput without higher clock speeds," MacDonald says. "We design one core and 'rubber stamp' them on to the die. Then it relies on the OS to comprehend threads and direct traffic."

CORE GANGS

AMD's vision for multicore systems is a little different. Weber believes cores will work together to tackle particularly difficult problems. "More and more computers will do multiple things simultaneously," he said.

"Background tasks like antivirus could be handed off to one core. Other programs will assemble work gangs of processors to all work on the same problem together."

Some of those cores could eventually have specialist functions that make them well suited to certain tasks.

The idea of specialist cores is certainly on Intel's radar. "Multicore starts at four cores," explains the company's technical manager for Australia and New Zealand, Graham Tucker. "We can see us getting to 100 cores at some point."

And with 100 cores, developing gets interesting. "You might rotate cores to tackle heat issues," Tucker says, "turning cores on and off so no single region gets too hot."

Another option is building specialist cores. "Remember when we put large caches on CPUs? To do that, we used two dies. The next step was to integrate the large cache on the same die. We do not see a problem until 2020 with transistor size reductions."

This means it should be possible for each core to comprise more transistors, leaving room for each to have a large cache, a floating

point unit to process mathematical tasks, or even structures to handle special functions.

Tucker believes this could eventually translate into a "manycore" machine, with several types of specialist core. Maths-intensive computing tasks will be handled by cores with big floating point units. Tasks needing a large cache will head for dedicated processors. And functions such as playing video could be handled by cores specially equipped to do that job and not much else.

"New software will also be needed to cope with manycore management, but if you look at the software being developed to manage clustered computers, you can see an approach that can be applied to multi- and manycore machines."

That's not necessarily a bad thing. As Holden's Sunbird so amply demonstrates, expertly mashing two technologies together doesn't always produce a great result. As we move beyond multicore computing, perhaps starting with a blank quantum slate (see "Getting quantum", page 87) will yield the best results of all. [EITB](#)

Five technologies to keep silicon on top

	Gate	Gate			
	1.2nm SiO ₂	3.0nm High-k		1.9nm	
	Silicon substrate	Silicon substrate			
Name	High K gates	Chip-to-chip connect	Imprint lithography	Nanowires and nanotubes	Crossbar latches
What is it?	Better transistors that use new manufacturing techniques and materials, often metals, to run faster and cooler and leak less current, thus improving processing power. Silicon chips are not perfect. If current leaks, an operation may not finish, so the CPU has to start all over again.	CPUs that clip together, Lego-style, to become uber-chips.	Stamping out chips, rather than etching them.	Microscopic wires embedded in silicon.	Lattices made of crosses assembled from nanowires. Molecules nestle in the gaps between each cross to store a value.
Why bother?	High K transistors carry less charge when closed to keep temperatures low, and more charge when open to help prevent errors.	CPUs have to be designed alongside motherboards and the rest of the computing paraphernalia needed to make a computer work. Chip-to-chip connect would mean computing power could be assembled in stacks, rather than tied to a motherboard.	The smaller components become, the harder it is to use a laser to etch details into a silicon wafer. It's easier to etch one copy of a chip design onto hard material, then press it into a soft material to create the required design. Think of making car licence plates to get the idea.	Nanotubes and nanowires could be made of copper or other highly conductive materials to improve silicon performance by providing better-defined pathways for electrons to travel.	Crossbar latches can be spaced 2nm apart, which shrinks chip size. They run cool and seem easier to create at that size than transistors on silicon. Also very error-tolerant. Bad manufacturing won't be fatal, so potentially lower cost.
Status	Already works in the lab, can be expected this decade.	Still theoretical, although precedents like the PC 104 standard show that components can be assembled into functioning computers without the need for a motherboard or backplane.	Intel doesn't like it, but other companies are exploring the technology and have already achieved success at 10nm.	Like most nano, the theory is okay, mass production is very difficult.	HP has a patent and has demonstrated that they work.
What's the problem?	No real downside. Only a matter of time before commercialisation.	Nice idea, little real work to prove it.	Unproven.	Copper tops out at 10GHz, making copper nanowires a medium-term solution at best.	Early days yet for this one, which has only been demonstrated for memory, not for processing tasks.

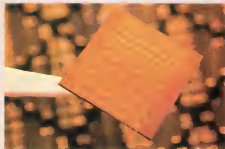
End of the road: enter the next generation

PHOTONICS

Intel concedes that semiconductors will one day run out of puff, and it's already working on photonic processors as one alternative. Photonics use photons (the particle that makes up light) instead of electrons, a swap that makes sense because they are smaller, lighter, cooler and faster than electrons.

Photons are also already widely used — fibre optics use them for communications. The technology is well understood and fibre optics have even been grafted into conventional silicon. Then there's the prospect of developing new types of silicon which emit light so that a conventional silicon-based processor could send signals to a photonic device.

Speed is the issue here: silicon can emit light, but only at about 20MHz. Much faster



Intel has designed the first ever chip that can produce a high-quality laser beam. Eight lasers are built into each chip.

flashing will be needed to make this viable.

Many researchers are investigating how to build devices that pack millions of light-wielding switches into the same space as a conventional silicon device.

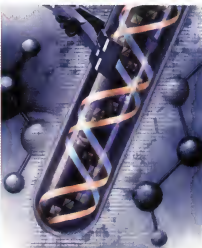


As light is amplified inside the chip, an electronic device called a "P-I-N" that surrounds the laser removes excess electrons from the path of the light. By removing this fog of light-absorbing electrons, the PIN device allows the laser to sustain the beam of light.

PC IN A BUCKET

Another candidate to take CPUs beyond silicon is DNA. Scientists now believe that if they can code individual strands of DNA and combine them with other pre-prepared strands, a predictable result will transpire. Researchers have already assembled basic computing elements in test tubes, giving rise to visions of computers in a bucket.

While the notion of computing DNA seems an extraordinary departure from conventional particle-shuffling techniques, it has many advantages. There's no shortage of DNA, it's non-toxic, doesn't generate heat, and is extremely small.



For beyond silicon: individual strands of DNA could be coded and combined to produce a predictable result.

GETTING QUANTUM

Compared to quantum computing, DNA computers seem positively simple.

In the mind-bending realm of quantum computing, ideas about zeros and ones go out the door. They rely on the "superposition" of particles, which have a quality called "spin" measured in terms of the direction a particle rotates. Quantum computers interpret spin as a measure of "one-ness" or "zero-ness".

The tiny size of the particles involved — scientists expect to

use particles such as the quarks that make up electrons and photons — means that heat and other similar problems should be relatively easy to resolve.

Like DNA computers, simple quantum computers are already on display in laboratories. However, the change is so fundamental that scientists admit the complexity which comes with moving away from the absolute of ones and zeros means most computing tools will need to be recreated from the ground up.



Spin doctor: Dr Isaac Chuong (IBM) experimenting with the first quantum computer.

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3 looking for a crowd

Consumers are the real winners in the mobile broadband war, as 3G forces telcos to drop wireless plan prices. **Dan Warne** compares the packages.

Third-generation mobile operator 3 has introduced a new mobile broadband plan for \$29 per month which includes up to 100MB of data.

The company is targeting business users who need mobile email, and points out that although 100MB doesn't sound like a lot compared with traditional broadband plans, it goes a long way when used with a handset that can be set just to download the first few kilobytes of each email.

The plan has a minimum spend of just \$5 each month, making it ideal for occasional mobile data users who already have a 3 handset and don't want a long-term commitment.

However, like 3's previous \$99, 500MB Netconnect plan (which will continue to be sold), only data used in 3G's limited areas of coverage is included in the \$29/100MB offer.

Outside that, users roam to the Telstra GPRS network and are charged at \$4/MB.



A little goes a long way:
3's \$29/100MB capped mobile broadband plan is ideal for infrequent users.

To further confuse things, exceeding the 100MB limit on the 3G network costs \$1/MB.

It's still better value than Telstra's Mobile Broadband Service, which allows access via its Wi-Fi hotspots, GPRS, 1XRTT or EV-DO for 10 hours or 10MB of usage each month for \$29.

Vodafone, another competitor, has carved a niche for itself as an economical provider of mobile data. It has \$49 and \$79 plans for its mobile customers, which allow \$200 and \$500 worth of network usage respectively, including GPRS.

Optus has been slow to respond to wireless broadband competition, but it's now showing its hand. While the company conducts technical trials of two wireless broadband technologies, from UTStarCom and Siemens, it has announced it will resell iBurst wireless broadband around Australia. Unwired Australia also says it is in negotiations to expand its network around the country in partnership with Optus.

iPrimus chokes on Big Kahuna

iPrimus has raised the hackles of users and competitors alike after launching an "unlimited broadband" offer for \$5.95 a week.

Broadband user Web site Whirlpool.net.au said the offer "takes the cake for the most inappropriate use of the word 'unlimited' to describe a broadband plan", because it actually has a hard limit of 500MB a month, after which the speed drops to 64Kbit/s.

Meanwhile, competitor Telstra also demanded that iPrimus modify its advertising, arguing that it hadn't adequately informed consumers that they also had to take iPrimus telephony, bumping the total cost up to \$54.23 per month.

Spokesperson Bob Bowden said iPrimus would not be withdrawing the offer nor modifying its advertising.

Telco industry forcibly cleaned up

Contracts with ISPs and telcos are to be reviewed under a new Australian Communications Industry Forum (ACIF) code.

The code was developed in response to complaints from users that the wording of telecommunications contracts is too complex or technical for the average person to understand.

Another major complaint is that contracts frequently allow service providers to vary terms and conditions after customers have signed up for a service, but don't offer the opportunity to terminate the agreement.

Telcos must now reissue contracts that don't meet the standards. To find out more, go to www.acif.org.au.

Your monthly guide to the best deals

APC is proud to partner with the independent broadband monitoring service Broadband Choice (<http://broadbandchoice.com.au>) to bring you the best broadband deals every month.

The comparison table on the following pages focuses on internet service providers that best serve the majority of APC readers' needs. These include coverage in Melbourne, Brisbane and Sydney; and 1300, 13 or 1800 telephone support.

We've only listed those that meet at least three of our four plan selection criteria:

- Budget plan: cheapest deal under \$30.
- Light plan: cheapest deal under \$65, with at least 512Kbit/s speed and 1GB data.
- Family plan: largest download allowance under \$90, at least 512Kbit/s and 5GB data.
- High speed: cheapest 1.5Mbit/s plan under \$160, with 4GB data minimum.

If an ISP has "unlimited downloads" but speed is throttled after reaching a certain limit, the portion in which you can get full-speed downloads is listed as its limit.

APC has picked the lowest price for a contract period of six months or less for broadband installation. Otherwise, the lowest priced option was selected. The installation price doesn't include a modem because you may get better value by buying one separately.

Can't find your provider in our list? That's because some of the largest ISPs, and many smaller ones, didn't meet the selection criteria.

ISPs enter their own information into the Broadband Choice database. ISPs can contact bc@whirlpool.net.au for more details. Data for the following table was extracted from the BroadbandChoice database on 19 May 2005.

ENUM:

Privacy please!

By definition, ENUM is about aggregating personal information. But the fact that your ENUM number is based on your public switched telephone network (PSTN) number essentially means anyone who understands the way ENUM works can quickly determine your phone number. There's no such thing as a silent number here!

This problem can be solved if VoIP is used for phone calls in conjunction with a system that allows calls to be automatically screened. As with instant messaging programs, you could pre-approve callers in your address book, and make other callers wait for authorisation. This would actually improve on the privacy we have with phone lines today, doing away with telemarketers altogether.

Local privacy laws force local operators to protect the data stored in your ENUM record in the same way that .au Domain Administration Ltd (AuDA) protects most WHOIS information related to .au domain registrations.

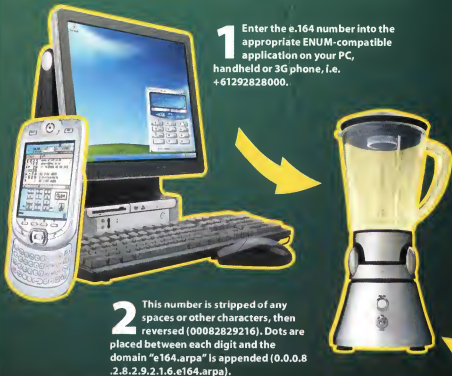
However, because ENUM will be available as a public service, an unscrupulous hacker could theoretically write an application that takes advantage of legitimate ENUM hooks to harvest your personal information — and then spam the living daylights out of you. Hackers might also target an ENUM service provider's database.

But don't get paranoid yet; this is all hypothetical. And it isn't a problem with the ENUM protocol, rather with the way it's implemented. Routing may well be implemented as a one-way service, so that external parties never actually know which number or email address their message is sent to.

"The real question is who owns the data," says Chris Disspain, CEO of AuDA, who sees privacy as a critical part of the ENUM trial. "The difficulty arises in whether you look at this as a telecoms or DNS tool. If you follow the telecoms model, you don't own the number and you pay for privacy. On the other side of the coin, the application itself will need to deal with that."

DNS for your phone

The Internet's existing Domain Name System converts plain-English URLs into a server's four-digit IP address, which your system and the host system actually use to communicate. ENUM serves a similar function but accepts e.164 phone numbers — the worldwide addressing standard, including the full number and country code.



1 Enter the e.164 number into the appropriate ENUM-compatible application on your PC, handheld or 3G phone, i.e. +61292828000.

2 This number is stripped of any spaces or other characters, then reversed (00082829216). Dots are placed between each digit and the domain "e164.arpa" is appended (0.0.0.8.2.8.2.9.2.1.6.e164.arpa).

A new technology has emerged that could be as important as the DNS (Domain Name Server) system in letting people access information in a user-friendly way. David Braue reports.

In May, Telekom Austria launched an ENUM (Electronic Telephone Numbers Mapping) service that lets users make any IP resource addressable using a normal phone number.

ENUM (www.itu.int/osg/spu/enum) first surfaced in 1998 and was ratified as an Internet standard in 2000. It's mainly used as a way of calling up Web pages using a normal phone number. ENUM customers register a series of IP protocol destinations which are then resolved to an IP address through an interchange between DNS and ENUM servers.

The idea is to have one contact number for your Web page, email, online gaming, FTP site and so on. Better still, ENUM routing can also be combined with a rules engine: you might, for instance, use a Web control panel to route all incoming calls directly to voicemail.

If it's so useful, why isn't ENUM universal? Because it's a solution looking for a problem. Despite the many possible uses for ENUM, it seems no-one wants to pay for such a service. "It's very hard explaining ENUM to experts, so you can forget explaining it to end users, except with techno-freaks," says Richard Stastny, senior analyst at Telekom Austria. "But you can't build a business on freaks."

Living proof of that fact is 0500, the ill-fated "follow-me" service launched with some fanfare years back, then quietly discontinued due to a lack of customer interest. Can ENUM avoid irrelevance in the same way? "It's very difficult to take a business model from the ENUM trial," says JongYun Ra of the National Internet Development Agency (NIDA) of Korea. NIDA trialled ENUM for email, fax,

4 ENUM queries the name server to retrieve NAPTR records which provide ENUM endpoint IP addresses for Web, SMS, VOIP, fax, email, mobile, PSTN and more.

5 The ENUM application checks its own rules to decide which destination is appropriate, then routes the message or request.

3 This address is fed to the DNS system, which returns the IP address of the relevant name server (in this case Australia's is 1.6.e164.arpa).

6 The connection is complete.

SMS, instant messaging and as a way to search a directory of registered ENUM services, from October 2003 to January 2004. It's planning a commercial ENUM service in 2007 — the delay giving NIDA and its partners the opportunity to produce an actual business model.

As in Telekom Austria's trial, NIDA included both technical trials and the dissemination of ENUM toolkits to encourage developers. Similar public trials in Poland, Romania, France, Finland, Germany and Japan — as well as private trials in the US and other countries — have confirmed that ENUM works as designed, easily supporting 100 million addresses.

TRIAL BY ENUM

Australian "freaks" now have a chance to give ENUM a spin after the Australian Communications Authority (ACA) kicked off a year-long trial (www.enum.com.au) on June 1. Joining the ACA are AusRegistry International, which administers the .au DNS domain; AARNET, which provides Net access

to more than 900,000 users in universities and the CSIRO; and domain name reseller Enetica.

All are optimistic the trial will reveal valuable new uses for the protocol. Academics in particular hope to put ENUM through its paces with promotion by AARNET. "AARNET sees ENUM as an incubator for advanced networking technologies," says the company's CEO, Chris Hancock.

One such area is in delivery of mobile content, since most new mobile phones are capable of displaying Web pages or, at least, images. Combine that with the IP stacks being built into 3G and other mobiles, and you've got a ready-made ENUM endpoint.

Some applications may even be divorced from phones. For instance, after landing at an airport in a new city, you could type your hotel's phone number into the rental car's navigation system. ENUM would route the enquiry to the hotel Web page, allowing the navigation system to retrieve co-ordinates and automatically program itself. www.apcmag.com

Putting ENUM to use

Early in June, 17 representatives from 12 international telecommunications authorities gathered at European Telecommunications Standards Institute (ETSI) headquarters in France, where an ENUM trial ran for 17 months from February 2003. The goal of the first ETSI Plugfest? To test how well ENUM protocols can communicate when implemented on a variety of different systems and software.

At that event, the main focus was on testing various provisioning systems, which let subscribers configure their ENUM services; "end system" programs that read this data and use it to set up calls or send messages; and ENUM-aware VoIP proxies or gateways that route incoming PSTN calls to VoIP phones.

It may not sound very attractive, but these applications are critical to turning ENUM into a viable, consumer-friendly service. Once they're in place, however, the sky's the limit. Here are a few applications ENUM makes possible: **SMS to landline:** ENUM transfers the message to a mobile phone or email address, depending on preference. **Free freely:** you probably know your friends' phone numbers, but may find it hard to remember everyone's email or online gaming alias. Type in their phone number, and ENUM will find their details. **Face-to-face phoning:** videoconferencing is easy, but it can be difficult to find the person you want to conference with. Use ENUM and you can find them via their phone number.

Find the party without knowing the address: type a friend's phone number, and an ENUM-based service could pull their address from their home page, or even the White Pages. Once car navigation systems support ENUM, they will have the potential to program the destination automatically. If your mobile has built-in GPS, you won't even need the in-car system.

Take it away: can't be bothered trying to type a Web URL into your mobile? Just dial the company's phone number and ENUM will direct your phone to its Web site.

Faxes to your email: fax-to-email services are common, but all require a different number. Add ENUM to your existing fax line and it can route the calls to a server that will email the fax to your account.

Three's company: ENUM can forward communications to anything with an IP address, such as a 3G phone.

Vint Cerfs into town

When the "father of the Internet", Vint Cerf, dropped by APC recently, Dan Warne was agast to hear that home routers are breaking the Net, ISPs are ripping people off, and P2P will be less anonymous in the future.



When you designed TCP/IP, you intended each computer on the Internet to have its own IP address. Nowadays we have home routers which share Internet connections between multiple computers, and that confuses a lot of Internet protocols. Are port forwarding and NAT "breaking" the Internet? Well, NATs do break the end-to-end architecture of TCP/IP in ways that I'm not happy about. Port forwarding is a form of tunnelling and that's not quite so bad.

Some ISPs are very parsimonious about their use of address space because they want to maximise the revenue they can produce per IP address. If someone says, "I have a dozen computers at home and I need a dozen IP addresses," that's 11 customers their ISP can't sell an address to.

At the moment there's a lot of clumsiness in getting two computers to talk to each other if they're behind NAT boxes, unless both users have set up manual router configurations. I'd have preferred not to end up at this situation, but I'm willing to accept a certain amount of pain and agony in exchange for having got

TCP/IP into widespread public use. In the absence of routers sharing Internet connections, we might not have seen enough

We're not running out of Internet IP addresses at all - 40% are still unallocated. (Source: Vint Cerf)

investment to spread the Internet to the general public.

I accept that NAT boxes will probably be around for the rest of my lifetime, but at least we're starting on our way to getting [the next-generation networking standard] IP version 6 [IPv6] out there. It's been 10 years since it was standardised and we're only just seeing customer interest now.

Could we ever fix the problem caused by routers and firewalls?

IPv6 will give us an opportunity to move back to the basic end-to-end paradigm, which is how the Internet was intended to work from the beginning. This won't eliminate firewalls, of course, which are intended to restrict traffic, but it will allow for IP addressing where each

computer has a proper public IP address. That will help where you want to initiate peer-to-peer communication with a target.

What practical benefits does IPv6 offer?

There are a number of improvements, but some key ones include capabilities that make mobile computing easier to support, with the ability for a computer to disconnect and reconnect quickly from a network.

Multihoming is also somewhat easier. That's where you have more than one Internet connection from separate providers, so that if one goes down the other will keep working.

Compression of network traffic is more efficient, and end-to-end security is built-in, with the protocol able to go into encrypted mode on-the-fly.

What will push adoption of v6?

Any device that's used in large numbers. Set-top boxes, handheld PCs, phones, cars, will all eventually need Net access. Manufacturers are starting to say, "Gee, we'd really like to have v6 capability so we don't find ourselves constrained by IPv4's addressing space."

Sony has announced that it wants to IPv6-enable all of its consumer electronics by the end of this year. Whether it does or not is another question. But if it does, we'll have a large number of devices available that consumers will want to connect to the Net.

Are we running out of Internet addresses?

No. About 40% of the addresses in the IPv4 space are unallocated! Those of us on the technical side of all this are very concerned that some people promoting IPv6 are implying that we're about to run out of IPv4 addresses. Truth is, nobody knows when we'll run out... it could be 2010, or 2030. It depends a lot on what the applications are.

What's stopping us from using v6 today?

There are a lot of little details to be worked out. The domain name system needs to have IPv6 in its tables and respond to queries correctly. Software and hosts on the Internet have to be not surprised when an IPv6 packet turns up, and the routers have to be able to do their routing protocols in both v4 and v6.

Peer-to-peer has raised the question that some people would like to be anonymous on the Net. For many people, that's simply so they can pirate stuff. But is anonymous TCP/IP really possible?

In some senses, IP addresses are kind of anonymous, because they're not necessarily bound to a person — an IP address can be dynamically assigned to someone's notebook at an airport hotspot. Of course, you can work your way backwards by combing through logs and saying, "Well, this IP address was allocated to this customer at a certain time, and we have their credit card."

On the other hand, you can use services which take packets that come in, strip away their source IP address, replace it with a different one, pass it back into the Net, and you have no idea where they came from. There are email anonymisers, IP packet anonymisers... And if you really wanted, you could generate packets that don't even have a valid source address in them, although that usually doesn't work for any two-way protocol! So there are lots of ways to achieve anonymity.

That said, I think we should be going the other way and looking at ways of insisting on

authentication. If you're running IPv6, you have to run IPSec if the other side requests it. Depending on how the key exchange works, that could remove a certain amount of anonymity.

But it's actually very hard to guarantee full, end-to-end authentication, even in IPv6. You have to work your way up the protocol stack. When you finally get to an application running end-to-end between the hosts — a Voice over IP session, for instance — that's when you can say: "I don't care what your IP address is. Show me your crypto certificate."

So it sounds like illegal P2P file sharing might be more difficult in future.

First of all, let's make sure nobody thinks that P2P is brand new, or inherently illegal. When we designed TCP/IP, it was designed for peer-to-peer, what we called "simultaneous initiation between parties". When you simultaneously initiate a TCP/IP connection between two parties, only one connection gets formed, not two... unlike certain other protocols that didn't quite make it. At no time was P2P not thought about. It was part of our primary vision of how computers would interact with each other on the Net.

Of course, P2P is notorious because people use it for file sharing and all sorts of other things. It doesn't make it inherently bad. But it does mean that if you don't like what people are doing with it, you might have to do something about it. Shutting down peer-to-peer protocols is not the way to do it. You go after the people who are infringing copyright.

The biggest application on the Net at the moment is BitTorrent. I've concluded that it's a really clever algorithm for distributing files on the Net in a way that doesn't create congestion points. There's a way to use that commercially to distribute, say, encrypted material that can be unlocked for an appropriate fee.

Given that distribution costs wouldn't have to be borne by the copyright holder, that fee may be a lot lower than video on demand services. So I'm enthusiastic about saying to copyright holders, "Instead of suing, why not use this as a new form of distribution?"

VoIP calls glitch and drop out if a packet gets delayed, which happens often on congested network links. What's to stop an

I'm willing to accept a certain amount of pain and agony in exchange for having got TCP/IP into public use

ISP from ensuring packets on its own VoIP service get maximum priority while competitors get put at the back of the queue?

That's an example of the failure of network neutrality, a principle I strongly believe should be observed.

Some of the cable TV companies in the US, for example, reportedly interfere with streaming video in order to make it look bad, so people will buy their conventional service. I urge regulators to treat that as a violation of fair access policies and insist it be stopped.

VoIP usage is expected to hit 19.2 million users in the USA by 2007.

(Source: TIA and Wilkofsky Gruen Associates, BuddeComm)

Finally, have tech companies done a good job of implementing TCP/IP? Is it easy enough for the average user to configure?

TCP/IP was never intended to be seen by anyone other than a programmer. Most implementations are pretty good, but often need some tuning for highest performance, or operation in stressed environments [with a high delay, high dropout rate].

Vint Cerf is the chairman of the international domain name authority ICANN, and senior vice president of Technology Strategy for MCI.

Six appeal

Massive US ISP EarthLink has hacked the source code of Linksys's popular WRT54G home router to support IPv6. Anyone can now download the firmware and reflash their WRT54G to get IPv6 support (www.research.earthlink.net/ipv6). The idea is that if your ISP supports IPv6 too, you'll be able to have a public IP address for every computer on your home network.

Why should you care? Potentially, you'll be freed from the pain of configuring your router with fiddly port forwarding rules to make things like VoIP, instant messaging file sending and P2P work properly. However, Australian ISPs are still lukewarm about IPv6. Linksys confirms it is working on formally putting IPv6 into its routers, but it will be at least 18 months until it starts gathering momentum for home users.

IPv6 offers 665 million quadrillion addresses for every square metre of the Earth's surface. (Source: mcpmag.com)

BROADBAND DIRECTORY

[illegible]

Key: * ISP charges excess usage fees when you exceed your download limit; † This price only available if bundled with long distance telephony from the ISP; ‡ Additional download allowance available with this plan for use in off-peak periods; ^ ISP combines sent and received data when calculating usage.

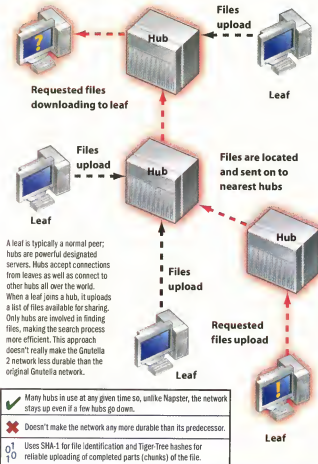
Hyperion 20L	1800 025 297	www.hyperion.net.au	\$33.95 ¹ 20048 2500x/s	N/A	\$79.95 No limit 5120x/s	\$129.95 No limit 1500x/s	✓	5	\$100.05 1cm
Thunderbolt 2 40S	13 19 17	www.rivet.net.au	\$29.95 ¹ 50048 1300x/s	\$29.95 ¹ 200 ¹ 1500x/s	\$89.95 ¹ 4020 ¹ 1500x/s	\$49.95 ¹ 3004 ¹ 1500x/s	✓	5	\$99 6cm
CP 40SL	1300 301 286	www.apc.net.au	\$29.95 ¹ 30048 2500x/s	N/A	\$89.95 ¹ 4020 ¹ 400x/s	\$43.95 ¹ 1000 ¹ 400x/s	✓	5	\$99.95 6cm
Intrepid Connecter 40SL	1300 308 399	www.ric.com.au	\$29.95 50048 2500x/s	N/A	\$89.95 No limit 5120x/s	\$109.95 3004 ¹ 1500x/s	✓	5	\$120 6cm
Intervide 40SL	1300 398 233	http://deli-lab.net.au/deli	N/A	\$59.95 1600 5120x/s	\$29.95 3008 5120x/s	\$29.95 508 1500x/s	✓	5	\$120 6cm
Intrepid Pro Macro 2005 40SL Pans	1300 398 233	http://deli-lab.net.au/deli	N/A	\$59.95 1600 5120x/s	\$79.95 1600 5120x/s	\$89.95 1600 1500x/s	✓	5	\$120 6cm
Phantom 2005 40SL	1300 398 233	http://deli-lab.net.au/deli	N/A	\$49.95 200 5120x/s	\$69.95 1200 5120x/s	\$119.95 1200 1500x/s	✓	5	\$99 12cm
Phantom 2000 ¹ 40SL	1300 614 648	www.grips.com.au	\$19.95 ¹ 20048 2500x/s	\$49.95 200 5120x/s	\$54.95 1200 5120x/s	\$89.95 ¹ 1000 1500x/s	✓	5	\$41cm
ES&E Illuminat	1300 751 749	www.grips.com.au	\$29.95 ¹ 40040 200x/s	\$49.95 200 5120x/s	\$54.95 1200 5120x/s	\$89.95 ¹ 1000 1500x/s	✓	5	\$99 12cm
Rose 40SL	1300 733 417	www.kinco.com.au	N/A	N/A	\$61.95 1200 5120x/s	\$64.95 1000 1500x/s	✓	10	\$119 6cm
Linea 40SL	1300 721 225	http://www.audio4.com.au	\$29.95 ¹ 30040 2500x/s	\$49.95 ¹ 100 5120x/s	\$79.95 1000 5120x/s	\$89.95 1000 1500x/s	✓	5	\$110 1cm
Multiple Intrepid 40SL	1300 665 605	www.audio4.com.au	\$29.95 ¹ 20048 2500x/s	N/A	\$99 ¹ 1000 ¹ 1500x/s	\$99 ¹ 1000 ¹ 1500x/s	✓	5	\$130 1cm
MicraStar 40SL	1300 114 638	www.audio4.com.au	\$24.95 ¹ 20048 2500x/s	\$49.95 ¹ 400 5120x/s	\$79.95 ¹ No limit 5120x/s	\$99.95 ¹ 1600 1500x/s	✓	5	\$120 6cm
NetStar 40SL	1300 123 215	www.schley.com.au	\$29.95 ¹ 20048 2500x/s	\$49.95 500 ¹ 5120x/s	\$59.95 No limit 5120x/s	\$29.95 500 ¹ 1500x/s	✓	5	\$99 6cm
Nitrogen 40SL	13 14 56	www.schley.com.au	\$29.95 ¹ 30048 2500x/s	\$49.95 500 ¹ 5120x/s	\$129 500 ¹ 5120x/s	\$129 500 ¹ 1500x/s	✓	100	\$135 6cm
Optimex 40SL	1300 720 720	www.optiro.com.au	\$29.95 ¹ 20048 2500x/s	\$49.95 100 5120x/s	\$89 ¹ 2004 ¹ 2500x/s	\$99 ¹ 1200 ¹ 1500x/s	✓	100	\$99 12cm
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Source: broadbandchoice.com.au. Published with permission

Second generation P2P services

GNUTELLA 2

One of the main problems with the original Gnutella is that many different nodes have to be contacted for a search to be conducted, leading to slow response times and poor search reach. To solve these problems, Gnutella 2's engineers took a leaf out of Napster's book. Instead of all nodes being equal, there are now hubs and leaves.



Peer-to-peer technology

Today, peer-to-peer (P2P) technology is synonymous with music downloading. Peter Sbarski explains how second generation P2P technologies work.



While it popularised peer-to-peer technology, in its original form Napster wasn't really a true P2P network at all. It used a centralised server system to manage peers and maintain file lists. This approach made searching and client management very easy, but only when it came to downloading did the appropriate peers connect directly.

The engineers behind second generation P2P networks such as Kazaa strove for greater decentralisation, security and privacy. After Napster was litigated out of existence, many users migrated to Kazaa, a program based on the FastTrack P2P protocol. Unfortunately, Kazaa became riddled with spyware and other problems. Others jumped on to the Gnutella/2 network. A little later, the eDonkey and BitTorrent networks gained support.

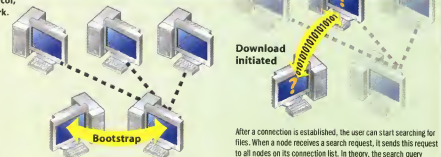
First generation P2P services

Since Gnutella was the basis for the FastTrack protocol, it's a good example of a first generation P2P network.

- ✓ If node is disconnected, network still functions. Still able to search for files, just via different paths.
- ✗ Network not always reliable. Can be quite slow.
- 01 Gnutella uses Secure Hash Algorithm (SHA-1) to generate checksums for the transferred files.



To establish a connection, a peer (called a node in Gnutella) must find another node to connect to. The address of the other node could be found on the Internet or built into the client software.



Once a connection (bootstrap) is established, the two nodes begin to "chat". The node joining the network receives a list of other active nodes and their addresses. Nodes typically try to exchange active addresses. When a node receives a new address, it tries to connect to it. The user can control the number of connections their node is allowed to make.

After a connection is established, the user can start searching for files. When a node receives a search request, it sends this request to all nodes on its connection list. In theory, the search query should visit every connected node on the network, but in reality this never happens. At most, the search query can scout a relatively small section of the network before Time To Live (TTL) expires, or something else occurs to stop the search. Once the user sees the result of the search, the download process can be initiated. If the user's node doesn't have a direct connection to the node with the required file, it establishes one.

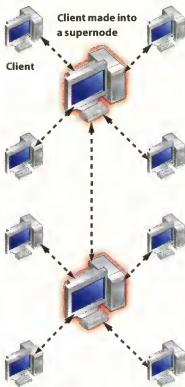
FASTTRACK

Kazaa and variations such as Kazaa Lite and K++ support the FastTrack protocol. It's also used by a host of other programs, including Morpheus, iMesh, Grokster and MLDonkey.

FastTrack modifies the original Gnutella protocol to add supernodes, which makes it look a little like Gnutella 2. Any FastTrack client can become a supernode, with the functionality built right into the software.

A supernode works like a hub in Gnutella 2 – it's used to index files of connected peers. Anyone can become a supernode and the client software may turn your peer into a supernode automatically – all you need is a fast connection and a powerful computer.

Normal peers only need to connect to one supernode to establish a connection to the network. The client software automatically uploads a list of files available for sharing and the user can begin searching and downloading immediately. Supernodes also connect to other supernodes, allowing search requests to move through the network very quickly. Once the required file is found, peers establish a direct connection.



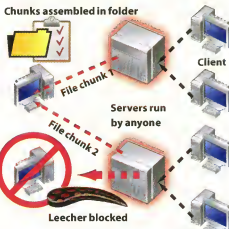
- | | |
|----------|---|
| ✓ | Any client can become a supernode. |
| ✗ | Corruption of files can occur easily. |
| 01
10 | Uses the fast but generally unreliable UUHash algorithm for generating checksums. |

EDONKEY NETWORK

The eDonkey network, also called eDonkey 2000, has more users than FastTrack or Gnutella. Similar to Napster in terms of its client-server approach, but with an important distinction — anyone can run a server.

Client applications are needed to connect to these servers and share files. Once a client connects to a server it can start downloading and uploading files.

File chunks can be downloaded from different sources in random order and then put together. After the download is complete, the user can continue to share the file by keeping it in a designated folder (for instance, the incoming folder if you use eMule as your software client).



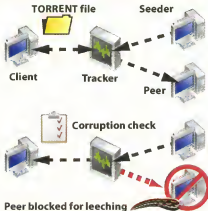
- | | |
|-----|--|
| ✓ | Excellent for downloading movies. No file corruption as each chunk is checked and re-acquired if necessary. Efficient because file chunks are available as soon as they are received. Keeps the network intact by penalising those who leech (that is, download excessively) and don't upload. |
| ✗ | The queuing system can sometimes unfairly penalise users. |
| 010 | Files are hashed using an MD4 algorithm, allowing identical files with different names to be recognised and used. |

BITTORRENT

To share a file, the user needs to create a TORRENT file containing information about the file being shared (name, size, address of its tracker and so on).

Once the TORRENT file is loaded, the client connects to the tracker, which tells the client where the file is located and who the seeders and peers are. Seeders are users uploading. The peers (or leechers) are users downloading. The client software requests the chunks of the file it doesn't have and downloads it.

As soon as a chunk is downloaded, it's checked for corruption. If everything is fine, the block becomes available for download by other peers. Leechers who don't upload much are discouraged by a seed/leech ratio. Some sites also force users to upload a particular amount of megabytes in order to continue downloading. Other sites restrict leechers from using torrents or force them to wait a penalty period.



- | | |
|-----|--|
| ✓ | Excellent for quickly downloading newly-released files. |
| ✗ | The reliance on trackers is a weakness, although progress has been made on decentralisation. |
| 010 | MD5 is used to prevent any file corruption. |

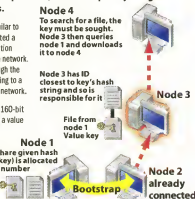
KADEMLIA/OVERNET

Kademlia is a decentralised P2P protocol, which completely foregoes the idea of clients and servers. Node 4

Every client is represented as a node, similar to the original Gnutella. Each node is allocated a unique 160-bit or 128-bit hash identification number which it retains until it leaves the network. To join the network, a node must go through the bootstrap process. This involves connecting to a node already connected to the Kademlia network.

Each shared file also gets its own unique 160-bit (or 128-bit) hash string. The file is called a value and the hash is called the key.

A node with an IO closest to the key of a particular value becomes automatically responsible for it. That means a node in Australia can, for example, become responsible for a file hosted in Norway simply because this node's IO and the key of the file are similar. To search for a file, the key of the required item must first be determined. When located, the node responsible for that key queries the node which originally published the key and the value. If the desired file is found, the download process can begin.



- | | |
|------|---|
| ✓ | Totally decentralised; has built-in redundancy. |
| ✗ | Despite using the same principles, Overnet and Kademlia are not compatible. |
| 0100 | Data stored using Distributed Hash Tables (DHT). |

THE FUTURE

Second generation P2P technologies have been extremely successful but the third generation P2P technology is already here (and will be covered in APC shortly). Get ready for decentralised, encrypted and anonymous P2P networks. [BTC](#)

Inside info

For more about P2P technologies, check out:

- Wikipedia P2P entries
<http://en.wikipedia.org/wiki/peer-to-peer>
- O'Reilly OpenP2P
www.openP2P.com
- Slyck
www.slyck.com

WORKSHOP

Hands-on with hardware and software, plus bonus DVD content

At your service

Windows XP's built-in Web server is great for setting up a test Web or FTP server. *James Bannan* comes to grips with Microsoft IIS.

Microsoft Internet Information Services (IIS) is the foundation of Microsoft's Web publishing standards, supporting the basic Internet protocols — HTTP, FTP and SMTP. Traditionally bundled with Windows servers, it's now included with Windows XP Professional for developers needing a Web platform for testing.

Windows XP Professional comes with IIS 5.1, while Windows 2003 Server uses IIS 6.0. The main limitation of IIS 5.1 is that it's restricted to 10 simultaneous client connections. This is fine for a testing server where the number of connecting clients will always be low, but not for a business server, no matter how small the company.

GETTING STARTED

You'll need the Windows XP installation CD handy. **1** Go to Add/Remove Programs and select Add/Remove Windows Components. Tick the box next to Internet Information Services, and then click Details. Tick File Transfer Protocol (FTP) Service and uncheck SMTP Service, as the mail service isn't required. Click OK > Next, and the installation will begin. You'll be prompted to insert the Windows CD for the file copy process. This takes between five and 10 minutes.

Go to Control Panel > Administrative Tools and you'll see a new entry — Internet Information Services. Click on it and the Management Console (MMC) snap-in for IIS is displayed. This shows your

local machine with IIS 5.1 running, with the available services in the left-hand column. Expand the plus sign (+) and you'll see that Web and FTP services are now active. Each has a default site preconfigured and running, using all available IP addresses.

Content for sites in IIS comes from the local file system. In this case, the default file source is C:\inetpub\wwwroot (for Web) and C:\inetpub\ftproot (for FTP). Launch Internet Explorer and go to <http://localhost>. Some IIS welcome pages and documentation will open. Clients connecting to your machine will see an "Under Construction" page.

Change the address in IE to <http://localhost>. You'll see a blank screen similar to Windows Explorer. This is the content of C:\inetpub\ftproot and, as you can see, there's nothing in it yet.

Launch Notepad. Type in the following code:

```
<html>
<head>
<title>Welcome to my webpage!</title>
</head>
<body>
<p>This is a test page</p>
</body>
</html>
```

2 Save the file as C:\inetpub\wwwroot\index.html (use Save As > All Files to avoid a TXT extension). When you launch <http://localhost> again, the same page appears. To avoid typing the full address each time, try <http://localhost/index.html>. Open the MMC snap-in again, expand the Web Sites section, right-click on Default Web Site and select Properties



Bonus DVD software

Video tutorial of this Workshop.

Skill level

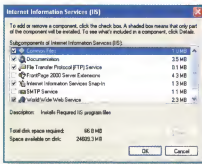
Intermediate

Requirements

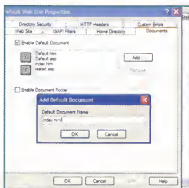
Windows XP Professional, including installation CD.

Time to complete

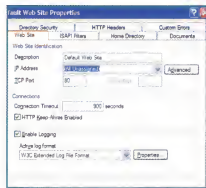
1 hour (approx)



1 Tick the box next to Internet Information Services, and then click Details. Tick File Transfer Protocol (FTP) Service and uncheck SMTP Service, as the mail service isn't required. Click OK > Next, and the installation will begin.



2 A default page ensures that the address bar will always show the root address of your Web server.



3 In the Web Site tab, the most important info is contained in the IP Address and TCP port fields.

> Documents > Add. Type `index.html`. Hit OK, and then click the up arrow until `index.html` is at the top of the list. Click Apply > OK, then OK again. Go back to `http://localhost` and the page you just created displays automatically.

DELIVERING THE GOODS

To test IIS with static files, create a ZIP file with anything in it. Make a new folder called Files in `C:\inetpub\wwwroot` and save the ZIP file in there as `content.zip`. Then, modify the `index.html` page between the `<p>`/`</p>` tags with the following code:

```
<p>This is a test page
<br>
<br>
<a href="Files/content.zip">Import
ant download!</a>
</p>
```

Save the file, return to `http://localhost` and refresh the page if you don't see the new Web link. Click on it and a file download box will open. Web clients can also download the file.

Copy the `content.zip` file to `C:\inetpub\ftproot`. Launch IE and go to `ftp://localhost`. The Explorer window has been updated to show the local content. Clients can download this file as they would from any FTP site.

To make files downloadable via links as well as FTP, create a virtual FTP folder. Open the IIS MMC snap-in and expand the FTP Sites directory. Right-click on Default FTP Site and select New > Virtual Directory. This launches the Virtual Directory Wizard. Click Next and type in Files as the directory alias. In the path, browse to `C:\inetpub\wwwroot\Files` and click Next. To prevent clients from viewing the folder contents, leave Write access unchecked. Click Next > Finish, and the directory is created.

Delete `content.zip` from `C:\inetpub\ftproot`. Open IE and go to `ftp://localhost/Files` to find the file, in `C:\inetpub\wwwroot\Files`. Create a copy of the file, refresh the FTP screen, and you should see the second file.

You now have just one point in your file system which needs updating, — leaving the default FTP source unchanged — useful when you use an HTML authoring tool which

uploads files with FTP. You can also update the live Web files within the `wwwroot` structure.

MODULE MANAGEMENT

3 The Web and FTP services can be modified. In the Web Site tab, the most important info is contained in the IP Address and TCP port fields. Go into the Properties of the Default Web Site. If your machine has multiple IP addresses (both wired and wireless, for example), you can set the Web service to be available on only one, leaving the other free. If clients are connecting to you via the system's hostname, this may increase their initial connection time but won't affect the speed once connection is established.

Port 80 is the default TCP port for Web services. However, if you don't want casual browsers stumbling across your Web page, port 81 is a popular alternative (but you should use a number higher than 1,024). Clients will need to specify the port to connect on, such as `http://localhost:81`.


Now select the Directory Security tab and click Edit. This page tells you which local user, created when IIS was installed, is used to allow anonymous access. To bar anonymous access, uncheck the box and tick Integrated Windows Authentication. This means clients will have to enter a username and password on your local system. Just create a local group with access rights to `C:\inetpub\wwwroot` (and `ftproot` if necessary), and add users as required.

To configure FTP services, select the Properties of the Default FTP Site. This also has options on the main tab to force the service over a specified IP address, and to change the connecting port number. The Current Sessions button shows who is connected, their username, which IP address they're connecting from, and how long they've been connected. You can bounce individuals or all users from your FTP service here.

In the Security Accounts tab, you can disable anonymous FTP access. This means that Windows authentication is assumed and you'll have to manage local access rights through the file system. For this, the hard drive must be formatted with NTFS.

At times, it may be necessary to restart or make services unavailable. If you right-click on either of the Default sites and select Stop, the

service will continue to run but won't be advertised, and clients won't be able to connect. If you right-click on the machine name and select All Tasks > Restart IIS, the Web and FTP publishing services will be stopped and restarted. Alternatively, jump into the Services snap-in (Start > Run > `services.msc`), right-click on either the FTP Publishing or World Wide Web Publishing services and select Restart.

One final note: if you have firewall software enabled, open the ports you've selected to use, otherwise clients will be blocked from accessing your system. 

Also in Workshop

100 Windows XP Settings

James Bannan explains how to keep your personal settings intact.

102 Mastering networking, pt 1

Stephen Withers demonstrates how to set up a basic network in a home or small office.

104 Photoshop Web buttons

David Emberton adds some style to a Web site's navigation in just a few steps.

106 Programming MP3 tagging

David Williams explains how to organise MP3s using ID3 tags and Visual Basic .NET.

108 Database ExportXML

Peter Drew distributes data in Microsoft Access XP and 2003 using ExportXML.

114 Programming VBA scripting

Customise Microsoft Outlook's Contacts list with VBA. Stephen Withers explains.

116 Mastering Linux, part 9

Jarrod Spiga walks through the installation of packages with RPM and yum.

All code fragments and examples given in Workshop articles are for demonstration purposes only. Questions or comments? Email workshop@apcmag.com.

Preferential treatment

Reinstalling Windows often means losing your preferences and customisations — or does it? *James Bannan* explains how to keep your personal settings intact.

If the need ever arises, reinstalling Windows is a relatively straightforward affair. The problem is re-creating all the customisation that reflects the way you like to work. This Workshop describes the methods, options and tools that enable you to back up your personal preferences.

WINDOWS FIRST

The best tool for backing up and restoring Windows preferences is bundled with the operating system itself. The Files and Settings Transfer Wizard was designed to make migrating to Windows XP much easier, but it works just as well for reinstalls.

1 Go to Start > Programs > Accessories > System Tools and click on Files and Settings Transfer Wizard. The first screen asks whether the machine you're on is the new or old one. Select the Old computer radio button and hit Next.

2 The next screen asks how you want to transfer the settings. As you're reinstalling on the same computer, you'll need to keep those files safe.

Skill level

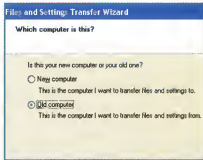
Intermediate

Requirements

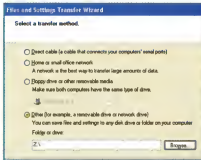
Windows XP

Time to complete

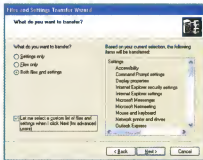
1 hour (approx)



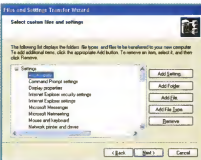
1 The wizard needs to know whether you're reinstalling Windows or setting up a new PC.



2 Ideally, save your customisations either to removable media or a networked location.



3 You can build a custom list of the settings and preferences you wish to save.



4 Your customised list prevents backing up preferences which were never changed.

Save them to either a networked location or removable storage. If you have more than one partition on the machine being rebuilt, you could point the application there, but be very careful when reinstalling.

3 The next screen asks precisely which files you wish to back up. Click on the Let me select radio button and hit Next.

4 Here, you're prompted to customise the selection you want to back up. This step prevents preferences which were never changed, such as Accessibility or NetMeeting, from being included. You can also deselect particular folders from the backup. For instance, although the C:\Windows\Fonts menu is excellent if you use a lot of customised fonts, it can also cause your machine to run slowly, which makes it a good choice for exclusion.

File types lets you know which kinds of files (within the selected folders) will be backed up. The default selection is comprehensive, but you can add to it from the full list of files registered on your system. You can back up any file type you like, but if that file is associated with a particular application — WinRAR or Adobe Reader, for instance — you'll need to reinstall those applications before the files can be accessed.

Once you've made your selection, hit Next. The wizard runs through the backup process and a DAT file appears in the location specified earlier.

Restoring the backup is straightforward. Once reinstallation is complete, run the wizard again and choose New computer at the appropriate dialog. When prompted for a Wizard Disk (only applicable when the old computer uses a previous version of Windows), select the bottom option — that the files and settings are already collected. Point to the location of the backup, hit Next and proceed with the wizard.

BACKING UP OFFICE

Microsoft Office preferences such as menu, button and toolbar layout, fonts and template modifications can also be retained through reinstallation thanks to Office XP and Office 2003's built-in backup facilities.

5 Go to Start > Program > Microsoft Office > Microsoft Office Tools and select Save My Settings. This launches a wizard which is very similar to the Files and Settings Transfer Wizard.

6 Choose Save the settings from this machine. Select Next and you'll be prompted for a location. Again, choose somewhere safe, preferably not on the machine being rebuilt. Then click Finish. This application doesn't offer any other customisation options. It backs up the settings from your Office apps and saves them as an OPS file.

Restoring personal settings in the Office suite follows the same procedure as the Windows restore. The one exception to this is Microsoft Outlook. The wizard won't back up contacts, emails or your calendar, and the best tool for this purpose is an add-on from Microsoft called Outlook 2003 Personal Folders Backup.

Despite its name, it actually works with Outlook 2000 and all later versions. Downloadable from www.apcmag.com/info/personal_folders_backup, this tool adds a Backup option to the File menu.

Click on it and you'll get the following options: save and back up (which requires that you exit Outlook); open an existing backup; or set options. The options are limited to the default save location and whether to make the backup a regular event.

To restore, open a saved backup to launch the PST data file created at the bottom of the View pane (the left-hand frame). You can then browse the folders, copy folders and/or email into the active data file.

7 Backing up your contacts and Outlook's calendar are a little more complex. To do so, go to File > Import and Export. Select Export to a File and click Next. It doesn't really matter what file type you select.

8 Select Contacts > Next, and choose a backup location and filename. Run through the same process with the Calendar folder. Once Outlook is reinstalled, you can jump into the Import and Export menu option to restore this information.

USING THIRD-PARTY APPS

Sometimes a third-party application is necessary for saving preferences. For instance, you might have a heavily customised program, and there's no wizard to back up the settings. Or you might just want to back up everything in one hit.

Some comprehensive packages are available from BackReX (www.backsettings.com) which back up almost every aspect of Windows, Office, Outlook Express and Internet Explorer, are compatible with every version of Windows and Office from 95 to XP/2003, and can restore settings to different versions of Windows. They're not free, but are great tools for desktop administrators who need to save multiple clients' preferences.

There's also a very useful free application called MM-Exporter for Macromedia users (<http://mm-exporter.joexx.de>) which saves and restores all site definitions and configuration settings for Dreamweaver, Flash and Fireworks.

TRAWLING THE FILE SYSTEM

If there's no application or wizard available, the next best bet is to look within the file system itself. Check out C:\Program Files for all the various subfolders in which your applications are installed.

In many instances, an application will save its settings (and any customisations) in an INI or XML file. All you have to do is back this up and you can overwrite the default settings file once the app is reinstalled.

An excellent source is the Application Data folder (C:\Documents and Settings\%username%\Application Data). It's a hidden folder, so in Windows Explorer go to Tools > Folder Options > View > Show hidden files and folders.

This area contains user-based information for each application capable of accessing the resource. For instance, Adobe products store all the user settings in a Settings folder under the subfolder of each individual application — Acrobat, Photoshop and so on.

SmartFTP stores all its bookmarked FTP sites here, which is ideal if you can't remember the security credentials for each site. The same applies for CyberLink, Ulead, ATI, Nvidia and most Windows-based applications, including IE and Windows Media Player.

There's no restriction on copying application data from this folder and

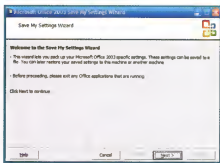
overwriting the default settings once you've set up everything again. However, copy the data *after* you've launched the application. This is because after a fresh install, many applications don't save any settings files until they've been launched once. Then they create and collate a basic file which can be replaced with your backup.

THE LAST RESORT

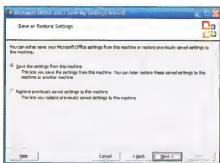
If all else fails, look in the registry for application preferences. This practice can be a bit risky, as you may restore something you didn't want to.

Jump into the registry (Start > Run > regedit) and navigate to HKLM_LOCAL_MACHINE\SOFTWARE. This area contains pertinent information about each app installed on your system.

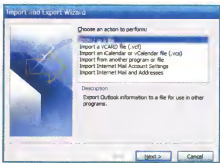
Some of the keys also store particular application preference information here — it's an alternative means of storing setting information than using INI files or the Application Data folder. When you've found the information you're after, try to select the key as far out on the branch as possible. This means you won't be exporting — and therefore importing — information you might not need. Select File > Export and everything will be dumped into a REG file, available for future importing. [\[TIP\]](#)



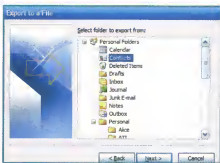
5 Office's built-in backup facilities can retain preferences for reinstallation.



6 Again, save the data to a safe, remote location. It will take the form of an OPS file.



7 Backing up your contacts and calendar in Outlook requires a Microsoft add-on.



8 However, it can still be done relatively easily using Outlook 2003 Personal Folders Backup.

Mastering networking, part 1

In the first instalment of this new Workshop series, *Stephen Withers* demonstrates how to set up a basic network in a home or small office.

Skill level

Beginner

Requirements

Ethernet interface(s)
• cable(s) • switch
(optional).

Time to complete

30 minutes to one hour.

In this series...

Part 1 — August '05
Basic setup

Part 2 — September '05

Wireless networking

...and more

These days, networking equipment is cheap, modern operating systems provide good network support as standard, and the desire to share a single Internet connection among several computers is widespread. This series of Workshops will explain how to create a network that will link all the electronic devices in your home or small office.

BASIC ETHERNET WITH TWO DEVICES

A network in its most basic form consists of just two devices. For example, it can be used for transferring files between a desktop PC and a notebook, or to connect a PC to a broadband modem.

The simplest way to connect two components is to run an Ethernet cable between them. However, you'll need to consider what kind of Ethernet cable to use. If the components have conventional Ethernet sockets (Medium Dependent Interface, or MDI), you'll need a crossover cable so that the "transmit" pin on one end is connected to the "receive" pin at the other, and vice versa.

Some devices, notably broadband modems, have reverse-wired sockets (Medium Dependent Interface Crossover, or MDIX) and connect directly to a PC with a standard Ethernet cable. Units with the Auto MDI/MDIX feature can automatically switch their internal pin assignments, and will work with either standard or crossover cables.

Tip: when buying crossover cables, select a colour that will enable you to quickly identify them.

START TALKING

Now you have two devices connected, you need to get them communicating. Windows XP makes the process easy. If neither of the computers has ever been connected to a network, they should immediately recognise one another.

Open My Network Places and click on View workgroup computers. After a pause, you should see two icons — one for the computer you're using, the other for the connected machine. Theoretically, both computers will assign themselves a compatible IP address if you leave them set to Obtain an IP address automatically, but it's more reliable to use manually assigned addresses.

To do so, start by setting the network (IP) address of each machine so they're all on the same subnet. In My Network Places, click View network connections. Right-click on the icon representing your Ethernet interface (probably labelled Local Area Connection) and select Properties.

1 In the Local Area Connection Properties window, scroll through the list to find Internet Protocol (TCP/IP), click on it, and then hit Properties.

2 In the Internet Protocol (TCP/IP) Properties window, select Use the following IP address, and type in an address such as 192.168.0.2. You don't have to use 192.168.0, but this part must be the same on both computers. What is important is that the final part of the address is different on the second machine. For example, if you use 192.168.0.2 on one, you might use 192.168.0.3 on the other.

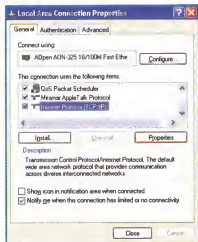
Next, click on the field labelled Subnet Mask, and Windows will complete it with 255.255.255.0. Click OK > Close. Now check that the workgroup name is the same on both computers.

Open Control Panel and double-click on System. Click the Computer Name tab to see the workgroup name, which defaults to MSHOME. The name isn't significant — the only criteria is that it must be the same on both computers and should have no more than 15 characters. Using all upper-case characters minimises problems if you extend the network with computers running older versions of Windows or other OSes that support SMB networking.

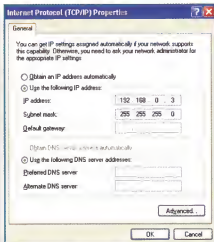
If you need to change the workgroup on one system, click Change > Workgroup radio button (if it isn't already selected), type in the workgroup name, click OK, then OK again to close the System Properties window and restart.

BASIC ETHERNET WITH MORE THAN TWO DEVICES

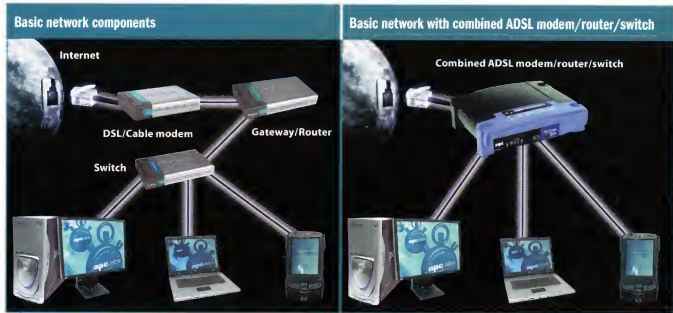
If you have to connect more than two devices, you'll need an Ethernet switch, sometimes called a hub. A switch provides direct connections between each of a row of Ethernet sockets, while a hub is an older technology which broadcasts packets to every



1 In the Local Area Connection Properties window, find and click on Internet Protocol (TCP/IP) and then click the Properties button.



2 In the Internet Protocol (TCP/IP) Properties window, select Use the following IP address, and type in an address such as 192.168.0.2.



Old school: this is the "traditional", and somewhat unwieldy, way of setting up a network.

New wave: rolling three devices into one, the modem/router/switch, creates a more elegant solution with less cable clutter.

socket. Switches built for homes or small businesses usually come in five- or eight-port models and cost around \$10 per port for well-known brands.

Ethernet computer networks traditionally support data transfer rates ranging from 10 to 100Mbit/s, but Gigabit Ethernet (GigE) now supports rates of up to 1,000Mbit/s. GigE switches are reasonably expensive at \$40 to \$60 per port for five- or eight-port models. If two or more of your computers are equipped with GigE, and you spend a lot of time moving large files around, you should give serious thought to buying a Gigabit switch rather than a 10/100 model. (You can also buy a Gigabit network adaptor for around \$50.)

One of the most common reasons for setting up a network is to share a broadband connection. Unless your provider offers multiple IP addresses, you'll need a router to connect your LAN to the ISP's network. The router sits between the switch and your modem, but frequently includes a four- or eight-port switch, with many models also providing a built-in ADSL modem (such as the D-Link DSL-504G or the Linksys AG041).

The basic network components diagram (above) shows a traditional component layout, and the basic network with combined ADSL modem/router/switch diagram (above, right) illustrates the layout for an integrated modem/router/switch.

Expect to pay around \$90 for a basic router and \$150 for an integrated modem/router/switch. More expensive models offer improved security through features such as

stateful packet inspection (SPI) and VPN support. They are also available in wireless configurations. Routers, SPI and VPN will be covered in a future instalment of this series.

SWITCH HITTER

Whether you're buying a switch or a router/switch, take your future needs into account. For example, if you buy a four-port router/switch and connect a desktop PC and a notebook, that's two ports gone. Then you want network access in a second room, so you're down to one spare port. Add a printer or print server and there's nowhere to plug in your new VoIP adaptor. You can always add a second switch and link the two via Ethernet cable, but each switch has its own plug pack and requires its own power point.

If you need multiple ports in a second room, it's easier to install a switch in that room and run a single cable between them. You probably won't notice any decrease in performance, except when two PCs in one room are exchanging files with two PCs in the other. In most cases, bottlenecks will be caused by something other than the cable linking the switches.

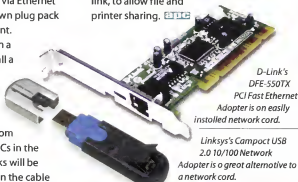
It's increasingly common for a PC to include an Ethernet interface. If yours doesn't, upgrading with a network card is inexpensive, and installing it yourself is a snap.

If you don't want to mess around inside your PC, or if you're using a notebook that lacks an Ethernet interface, a USB Ethernet

adaptor (\$50 to \$60) is an easily installed alternative. You'll need a USB 2.0 model and port on your computer if you want to exceed 10Mbit/s. Just plug the adaptor into a free USB port and install a driver, making sure to carefully follow the instructions.

Whichever type of adaptor you install, all that now remains is to link the Ethernet cable between the adaptor or built-in port and your switch or other device.

One final problem you may encounter is that a firewall (including XP SP2's) running on one computer may block access from the other. You may need to tell the firewall, and any applications you intend to use across the link, to allow file and printer sharing. [ETTC](#)



Next month . . .

Part two of the Mastering Networking series discusses the selection and installation of wireless interfaces and access points; and how to avoid making security errors.

Button it

Ready to add some style to your Web site's navigation?

David Emberton achieves the latest looks in just a few steps.



Bonus DVD software

Original Photoshop button documents (Originals)
• exported versions of each button with a label added (Exports) • HTML tables demo (Tables) • CSS demo (CSS).

Skill level

Beginner

Requirements

Adobe Photoshop (version 5 or later) • HTML editor.

Time to complete

1 hour (approx)



Three's a crowd pleaser: a selection of popular button styles.

Menu navigation is an essential part of any Web site, and an array of similar-looking links provides a familiar and obvious way to get around. The links can be textual (plain HTML anchors) or graphical.

Web designers have traditionally favoured large, chunky menu buttons, in line with the principle that when a button covers more area, it's easier to see and hit with the cursor. It's up to individual taste — many sites still feature tiny, inscrutable menus — but the styles detailed in this Workshop can be scaled up or down to suit.

Three different styles are demonstrated here: a plastic gel button inspired by the likes of Apple and Skype; subtle gradients, as favoured by Mozilla and Google's Blogger; and faded diagonal lines. These are the staples of modern button design, so they're worth knowing. Best of all, the basic effects can be achieved with Photoshop in just a handful of steps.

SLICK EFFECTS

The gel effect can be achieved using just four layers in Photoshop. Each has a Gradient Overlay effect applied to give the impression of light bending and reflecting through a gel-filled button.

First, open a new document. Since the entire canvas is used, either a white or transparent background is fine. In the examples (enlarged for illustration), the canvas dimensions are set to 200 x 80 pixels at 72 pixels per inch.

Using the Tools palette, set the foreground colour to #1A9FE9 by clicking on the colour tile and typing 1A9FE9 into the field marked with a hash (these are hexadecimal colour codes). Click OK in the Colour Picker dialog, then repeat the procedure for the background, this time setting it to white by typing the hexadecimal code FFFFFF in the Colour Picker.

1 The first layer in the Layers palette should be named Shape 1, or something similar.

Right-click on the name and go into the Layer Properties box to change it. Renaming layers as you create them makes the document easier to edit later on. Set the name of this first shape's layer to Bottom.

The next blue rectangle should take up the lower half of the canvas. Name it Lower Half. Draw it in as before, remembering to only fill half the space.

The Lower Half layer also needs a Gradient Overlay so that it will take on the desired look. Check for a button marked f on the Layers palette (the tooltip with Add a Layer Style, for instance). Click on it and choose Gradient Overlay. This process is repeated several times throughout the Workshop.

2 When the Layer Style dialog appears, change the Gradient Overlay to match the details in the table:

Lower Half	
Blend Mode	Normal
Opacity	40%
Gradient	Foreground to Background, Reverse (white to blue)
Style	Linear, Align with Layer
Angle	90
Scale	60

The first two rectangles were blue, the next two need to be white. Switch the foreground and background colours on the Tools palette by clicking the double-headed arrow icon. You should see them change so the blue square sits behind the white one.

3 Draw a third rectangle extending from the middle of the canvas to the top, and name it Upper Half. This layer needs to be semi-transparent, so use the Layers palette to set Opacity to 40%. Then add a Gradient Overlay with the settings in the table:

Upper Half (Layer Opacity 40%)	
Blend Mode	Normal
Opacity	40%
Gradient	Foreground to Background, Reverse (blue to white)
Style	Linear, Align with Layer
Angle	90
Scale	80

4 The last rectangle should sit in a layer called Top and take up the whole canvas area. It will appear to add a glossy reflection to the entire button. This rectangle should also be white. Draw and rename the layer, then set its opacity to 20%. Apply a



Layer by layer: the combination of colours and gradients produces a plastic look.

Gradient Overlay, noting that the gradient style is Reflected rather than Linear:

Top (Layer Opacity 20%)	
Blend Mode	Normal
Opacity	100%
Gradient	Foreground to Background, Reverse (blue to white)
Style	Reflected, Aligns with Layer
Angle	90
Scale	100

5 All that remains is to add a label using the Text tool. If you have it, set the font to Helvetica (Arial is a popular substitute), 36pt Regular with Strong anti-aliasing. The text colour should be set to black (hexadecimal code 000000). Draw a text box roughly a third of the way in from the left edge of the canvas, then type in the word **Label1**. If the positioning looks wrong, fix it with the Move tool.

SUBTLE GRADIENTS

While the plastic gel style is eye-catching, subtle gradients create more understated buttons and backgrounds.

This time, there's only one layer involved. Start a new Photoshop document with the same 200 x 80 pixels canvas as before, but use the Rounded Rectangle tool instead. To select it, click and hold on the Rectangle and choose it from the pop-out menu that appears.

For the purpose of this exercise, make the foreground colour #126B9B and the background #E8A71A using the Tools palette.

Draw a rounded rectangle with a corner radius of 30 pixels, tall enough to fill the canvas and extend below the bottom edge. Only the top corners should be visible, giving the look of a tab. The visible corners should sit flush with the top left and right of the canvas.

Now apply a Gradient Overlay using the settings in the table. You can make the effect even more subtle by reducing the opacity — a value as low as 5% will work.

Rounded Rectangle	
Blend Mode	Normal
Opacity	35%
Gradient	Foreground to Background (orange to blue)
Style	Linear, Align with Layer
Angle	90
Scale	100

Lastly, reverse the background and foreground colours and use the Text tool to add a label to the second button.



Rack 'em up: HTML tables are an easy way of arranging menu buttons.

DIAGONAL LINES

The first step in the third exercise is to define a new "pattern" in a separate smaller document to create the effect of repeating diagonal lines. Open a canvas with a transparent background five pixels square and set the foreground colour to #9C5911. Select the Line tool and draw at 45° from the lower left corner to the top right while holding the Shift key.

This one line can now be used as a fill pattern. Ensure the shape is deselected by clicking on the shape icon in the working layer so that the grey border of the line disappears in the document. Save the pattern by choosing Define Pattern from the Edit menu.

Now it's time to create the canvas (again, 200 x 80 pixels). Choose #000000 as the foreground colour, then draw a rectangle big enough to cover the available space. Apply a Pattern Overlay effect using these settings:

Rectangle	
Blend Mode	Normal
Opacity	60%
Pattern	Single Brown Line (as created earlier), 5 pixels
Scale	100%, Link with Layer

You should see an area filled with parallel lines. To give the lines a more interesting look, apply a Gradient Overlay effect to blend the contrasting lines into the background colour, so they appear to fade towards the top. Use the settings described in the table:

Patterned Rectangle	
Blend Mode	Normal
Opacity	100%
Gradient	Foreground to Transparent, Reverse (transparent to black)
Style	Linear, Align with Layer
Angle	90
Scale	150

Finally, add a label using the colour of the diagonal lines (#9C5911).

PUTTING IT TOGETHER

With all three buttons created, it's time to choose a favourite style. The next task is to export several buttons in that style, then add the exported images to an HTML menu.

To export, use the Save for Web option under the File menu. The buttons look better as JPEGs than GIFs because of the continuous gradations of colour involved. Keep the JPEG quality setting at maximum to avoid smears and compression artefacts. You can either change the text labels of your buttons before each export, or leave them the same.

Once you've named them button1.jpg and so on, and saved them into a folder, open an HTML editor. Start a new page, save it in the same folder as the button images, then add the following table code to the page body:

```
<table width="600" cellspacing="0" cellpadding="10">
<tr>
<td><a href="#"></a></td>
<td><a href="#"></a></td>
<td><a href="#"></a></td>
</tr>
</table>
```

To integrate the menu table, change the href values from # to a proper URL. The table is set to be as wide as the number of buttons multiplied by 200 pixels, with 10 pixels of cell padding. You can also lay out buttons using Cascading Style Sheets. A demonstration is available on this month's cover DVD. [\[11\]](#)

Inside info

- StyleGala www.stylegala.com
- Kaliber10000 www.k10k.net
- A List Apart www.alistapart.com

Playing tag

David Williams demonstrates the best way to organise your MP3s using ID3 tags and Visual Basic .NET.

Although the MPEG format was designed specifically for the storage of audio information, none of its layers can store detailed information about the data.

However, MP3 files are capable of saving the name of the artist and track, along with some additional information. These tags, known as the ID3 standard, are supported by most modern MP3 players. The original ID3 standard attached the information to the end of each file. That way, the tags didn't interfere with the music itself. Set in a fixed location, the tags were always 128 bytes and made up like so:

Starting Byte	Length	Purpose
1	3	"TAG"
4	30	Song title
34	30	Artist
64	30	Album
94	4	Year
98	30	Comment
128	1	Genre

Since the first part is the word TAG itself, checking an MP3 file for tag information is a simple business, nothing more complicated than looking for the word TAG 128 bytes from the end of a file. Note that the genre component is just one byte. This is because a word isn't stored there but a number which corresponds to a value in a predefined list.

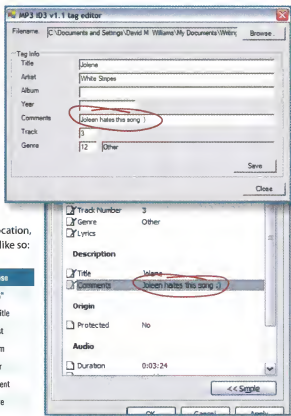
All tags are padded with the value 0 up to their length. Good MP3 readers stop reading a tag once a 0 is encountered. An enhanced standard, ID3v1.1, exploits this practice.

In this case, the comment is just 28 characters long. A zero-valued byte follows, and then the byte immediately before the genre holds the track number from which the music originates. The zero-valued byte ensures that a reader which only understands the original ID3 standard will not read the track number as part of the comments.

The ID3 standard has continued to evolve. ID3v2 now includes support for lyrics and other lengthy fields. The information no longer fits into a fixed-size block and has been moved to the start of the file.

CODING AN ID3 READER AND WRITER

With just a bit of programming experience in file-handling, it's easy to extract tags in the v1.1 format. In fact, the following Visual Basic .NET code



Test it: add a comment or other tag and click Save. The file properties field in Windows displays tag information, confirming that the app has written changes back to disk correctly.

does just that (if you don't have Visual Basic .NET, you can download the Visual Basic 2005 Express Edition Beta 2 from <http://lab.msdn.microsoft.com/express/vbasic/default.aspx>):

```
Private Sub loadTags()
    Dim iFile As Integer
    Dim fileLen As Long
    Dim strTag As New String(" ", 3)
    Dim strTitle As New String(" ", 30)
    Dim strArtist As New String(" ", 30)
    Dim strAlbum As New String(" ", 30)
    Dim strYear As New String(" ", 4)
    Dim strComment As New String(" ", 28)
    Dim bFiller As Byte
    Dim bTrack As Byte
    Dim bGenre As Byte
    Try
        iFile = FreeFile()
        FileOpen(iFile, strMP3File,
            OpenMode.Binary, OpenAccess.Read,
            OpenShare.LockReadWrite)
        fileLen = LOF(iFile)
```



Bonus DVD software

The source code for this article.

Skill level

Intermediate

Requirements

Visual Basic 2005 Express Edition Beta 2.

Time to complete

1 hour (approx)

Inside info

- The ID3 tag standard v2 www.id3.org/id3v2.4.0-structure.txt
- Academic paper on using MP3 tags for other purposes www.freelancepropaganda.com/archives/MP3vPDF.pdf
- Wikipedia article on ID3 tags, including genre codes <http://en.wikipedia.org/wiki/Id3>
- How a golden-age radio site uses tags for archives www.digitalidelftp.com/FTPSite/ftp_id3.html

```

If fileLen > 128 Then
Seek(iFile, fileLen - 127)
FileGet(iFile, strTag)
If (strTag = "TAG") Then
bHasID3v1Tag = True
FileGet(iFile, strTitle)
tagTitle = stripNulls(strTitle)
FileGet(iFile, strArtist)
tagArtist = stripNulls(strArtist)
FileGet(iFile, strAlbum)
tagAlbum = stripNulls(strAlbum)
FileGet(iFile, strYear)
tagYear = stripNulls(strYear)
FileGet(iFile, strComment)
tagComment = stripNulls(strComment)
FileGet(iFile, bFiller)
FileGet(iFile, bTrack)
tagTrack = bTrack
FileGet(iFile, bGenre)
tagGenre = bGenre
End If ' if strTag = "TAG"
End If ' if fileLen > 128
Catch ex As Exception
MsgBox("Could not read tags:" &
Chr(13) & ex.Message)
Finally
FileClose(iFile)
End Try
End Sub

```

The code simply reads the last 128 bytes of an MP3 file. If the text "TAG" can be found, the rest of the information can be extracted. If it isn't present, it means that there's no tag information.

Writing modified tag details (or adding them if they don't already exist) is straightforward. The program must replace the last 125 bytes with new information or add the data (including the leading "TAG" keyword) to the end of the file, like so:

```

Private Sub updateTags()
Dim iFile As Integer
Dim fileLen As Long
Dim strTag As New String(" ", 3)
Try
iFile = FreeFile()
FileOpen(iFile, strMP3File,
OpenMode.Binary,
OpenAccess.ReadWrite,
OpenShare.LockReadWrite)
fileLen = LOF(iFile)
If fileLen > 0 Then
If fileLen > 128 Then

```

Check if "TAG" occurs 128 bytes from the end:

```
Seek(iFile, fileLen - 127)
```

```

FileGet(iFile, strTag)
If not, you need to extend the
file:
If strTag <> "TAG" Then
Seek(iFile, fileLen)
End If

```

Of course, if the file isn't even 128 bytes, then it can't have a tag, so you need to add one:

```

Else
Seek(iFile, fileLen)
End If

```

If there's no current tag (and you're at the end of the file), write out the header:

```

If EOF(iFile) Then
FilePut(iFile, "TAG")
End If
FilePut(iFile, tagTitle)
FilePut(iFile, tagArtist)
FilePut(iFile, tagAlbum)
FilePut(iFile, tagYear)
FilePut(iFile, tagComment)
FilePut(iFile, CByte(0))
FilePut(iFile, tagTrack)
FilePut(iFile, tagGenre)
Else
MsgBox("This is not a valid MP3
file.")
End If
Catch ex As Exception
MsgBox("Could not write tags:" &
Chr(13) & ex.Message)
Finally
FileClose(iFile)
End Try
End Sub

```

Apart from a bit of extra housekeeping code to manage storage of the tags, this is the bulk of work to manipulate ID3v1.1 tags.

This issue's cover DVD includes complete Visual Basic .NET code. In particular, there are three files: cMP3ID3v1.vb, a class library to manipulate ID3v1.1 tags; TagLibrary.vb, a utility function to decode the genre byte; and frmTags.vb, a GUI front-end for a simple tag reading/writing application.

Open the supplied project in Visual Basic and compile and run it. A window opens, with room to display tags. These are blank to begin with. Click the browse button to locate an MP3 file. If the file contains tags, these will be displayed and can be edited. Click Save to write any modifications to the MP3 file. The GUI utilises the class library to perform its work. An instance is declared at the beginning:

```
Dim Tags As New cMP3ID3v1
```

When the user browses for an MP3 file, the filename is assigned to the instance's MP3File property. This causes the class to load the tags from the file, if they exist. The GUI then populates the onscreen text boxes as appropriate.

```

If (ofDialog.ShowDialog() =
DialogResult.OK) Then
tFilename.Text = ofDialog.FileName
Tags.MP3File = tFilename.Text
If Tags.HasID3v1Tag Then
gbTagInfo.Enabled = True
txtAlbum.Text = Tags.tagAlbum
txtArtist.Text = Tags.tagArtist
txtComments.Text = Tags.tagComment
txtGenre.Text = Tags.tagGenre
txtGenreDesc.Text = getGenreName(Ta
gs.tagGenre)
txtTitle.Text = Tags.tagTitle
txtTrack.Text = Tags.tagTrack
txtYear.Text = Tags.tagYear
End If
Else
MsgBox("This MP3 file has no
ID3v1.1 tag information.")
End If

```

Clicking Save causes the contents of the text boxes to be copied into the instance and then its update method called to write tags to disk:

```

Tags.tagAlbum = txtAlbum.Text
Tags.tagArtist = txtArtist.Text
Tags.tagComment = txtComments.Text
Tags.tagGenre = txtGenre.Text
Tags.tagTitle = txtTitle.Text
Tags.tagTrack = txtTrack.Text
Tags.tagYear = txtYear.Text
Tags.update()

```

CUSTOM TAG EDITING UTILITIES

With the ability to read and write tags, there are endless possibilities for useful applications. These needn't be programs that operate on only one file at a time — tools could be produced which set the album tag on every MP3 file within a nominated directory, for instance.

Other customised programs could be created to rename files so that they have consistent identification, perhaps built up from the track number and title.

Use the code with this article to begin writing MP3 tag tools. Once v1.1 tags are mastered, try moving onto the v2 format. Check "Inside info" (left) for details. [CUI3](#)

Easy Access

Peter Drew demonstrates how to distribute data in Microsoft Access XP and 2003 using ExportXML.



Bonus DVD software

The finished Access database.

Skill level

Beginner

Requirements

Microsoft Access XP or 2003 • XML-compliant Web browser.

Time to complete

1 hour (approx)

Inside info

- MSDN guide to ImportXML and ExportXML
http://msdn.microsoft.com/library/default.asp?url=/library/en-us/dnacc2k2/html/ode_accessxml.asp
- The W3C core XML working group
www.w3.org/XML/Core
- XML tutorials
www.topxml.com/tutorials
www.programmingtutorials.com/xml.aspx

Delivering Microsoft Access database solutions is difficult if some users aren't running Microsoft Office. While developers can distribute an Access database in conjunction with a runtime version of the application, they have to purchase the rights to distribute that version. Developers also need to implement an install procedure, even with very simple distributions. Sending an electronic copy of a report requires the receiver to have the Snapshot viewer installed, while Web distribution of data prior to Access XP was cumbersome at best.

Extensible Markup Language (XML) provides a standard which makes data more portable. By providing a structure of definable tags, code can access data without relying on the database engine. This makes transporting data to and from the Internet and between different programs much simpler.

With the introduction of XML support to Microsoft Access 2003, Visual Basic developers in particular can tap into the flexibility provided by XML in order to distribute data, without worrying about compatibility.

The ExportXML feature of Microsoft Access allows you to provide Web-based distribution of data directly from your database application to the people who need it.

This Workshop demonstrates the ease with which an XML-based Web page can be created to display data from an Access database. To do so, an XML data source is created, complete with schema and XSL (eXtensible Stylesheet Language) style sheet, wrapping the data into an HTML page that can be viewed by your browser — all by using a single line of Visual Basic code.

MANAGEMENT WITH STYLE

As an example, this Workshop will create a small database to manage the data collected in a poll on the favourite movie of visitors to a Web site. Assume a site has already been created to accept user votes and submit them to the Access database. The task then is to export a summary of the votes to a results page.

The next stage is to create a blank database named ExportXML.mdb and generate the following tables in Design View:

tblFilm fields:

ID (Primary Key)	Autonumber	Long Integer
FilmName	Text	80
ProductionYear	Text	4

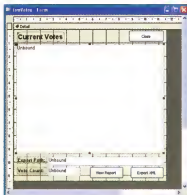
tblVote Fields:

ID (Primary Key)	Autonumber	Long Integer
EmailAddress	Text	120
Film_ID	Number	Long Integer

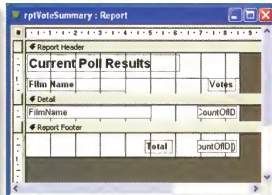
Next, set the Primary Key on each table to [ID] and add an enforced relationship between [tblFilm].[ID] and [tblVote].[Film_ID].

tblFilm data:

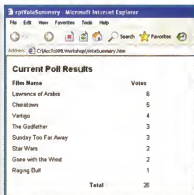
ID	FilmName	ProductionYear
1	Star Wars	1974
2	The Godfather	1972
3	Vertigo	1958
4	Lawrence of Arabia	1962
5	Raging Bull	1980
6	Chinatown	1974
7	Gone with the Wind	1939
8	Sunday Too Far Away	1974



1 The design view of frmVotes.

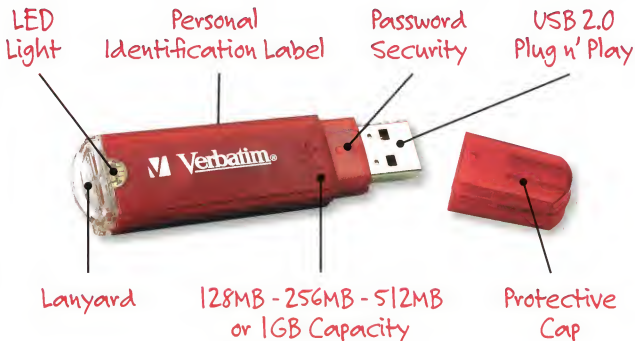


2 The design view of the report.



3 The finished report viewed with HTML.

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tblVote data:

ID	EmailAddress	Film_ID
1	joe@mail.com	1
2	tim@mail.com	5
3	craig@mail.com	6
4	julie@mail.com	4
5	marg@mail.com	3
6	mark@mail.com	1
7	john@mail.com	1
8	fred@mail.com	2

Add further votes to give your Web page enough data to demonstrate a range of responses on the final report. Next, create two queries:

qryVotes

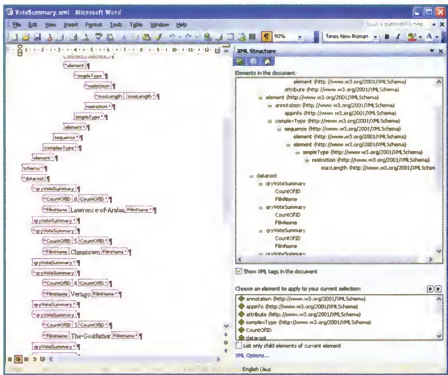
```
SELECT tblVote.ID,
tblVote.EmailAddress,
tblFilm.FilmName,
tblFilm.ProductionYear
FROM tblFilm INNER JOIN tblVote ON
tblFilm.ID = tblVote.Film_ID
ORDER BY tblVote.ID;
```

qryVoteSummary

```
SELECT Count(tblVote.ID) AS
CountOfID, tblFilm.FilmName
FROM tblFilm INNER JOIN tblVote ON
tblFilm.ID = tblVote.Film_ID
GROUP BY tblFilm.FilmName
ORDER BY Count(tblVote.ID) DESC;
```

Now create a form to display the current votes. Add a form called frmVotes. Open the form properties and change Record Selectors and Navigation Buttons to No. Add the following to the form to match the picture (turn off the wizard on the toolbar prior to creating buttons):

	Caption	"Current Votes"
Label	Name	"tblHeading"
	Font Name	Arial
	Font Size	14
	Font Weight	Bold
Command Button	Caption	"Close"
	Name	"btnClose"
List Box (Remove the Associated Label)	Name	"lstVotes"
	Font Name	Arial
	Font Size	10
Text Box	Name	"txtPath"
	Font Name	Arial
	Font Size	10



4 Microsoft Word 2003 view of the VoteSummary.xml.

	Caption	"Export Path:"
Label (Associated with txtPath)	Font Name	Arial
	Font Size	10
	Font Weight	Bold
	Name	"txtVoteCount"
Text Box	Locked	Yes
	Font Name	Arial
	Font Size	10
	Caption	"Vote Count:"
Label (Associated with txtVoteCount)	Font Name	Arial
	Font Size	10
	Font Weight	Bold
	Name	"btnViewReport"
Command Button	Caption	"View Report"
Command Button	Name	"btnExportXML"
	Caption	"Export XML"

Now add the code, making sure that Option Explicit is turned on so that all variables are dimensioned prior to use. Although initially it seems like additional work, in the long run it saves time. In larger projects, tracking the scope of a variable is much simpler with an explicit declaration. The following code sets up the form ready for use:

```
Const cDefaultPath As String = "C:\AccToXMLWorkshop\"
```

```
Private Sub Form_Load()
Call PopulateVoteList
Call SetDefaultPath
Call DisplayRecordCount
End Sub

Private Sub PopulateVoteList()
With Me.lstVotes
.RowSource = "qryVotes"
.ColumnCount = 3
.ColumnWidths = "0cm;5cm;4cm"
.Requery
End With
End Sub

Private Sub SetDefaultPath()
Me.txtPath = cDefaultPath
End Sub

Private Sub DisplayRecordCount()
Me.txtVoteCount = DCount("ID",
"tblVote")
End Sub
```

Notice that a constant containing a default path has been created to save the XML file. This default can be changed on the form, but consider changing it now to the directory you want to use — it saves time during testing.

Now add the code for the close button:

DOUBLE
WORD
SCORE

E S T U D I O

C₃

O₁

P₂

S C A N S

TRIPLE
WORD
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Y₄

H₄

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TOSHIBA

```
Private Sub btnClose_Click()
    DoCmd.Close acForm, Me.Name
End Sub
```

It's common practice to use the short form `DoCmd.Close` as it simply closes the active form. This is fine where there are only a few forms, but can cause problems, particularly where modal forms are used. Get into the habit of using the expanded version of the close method on all forms and reports.

DISPLAY TIME

The next step is to create a report to display the data. Create a blank report in Design View. Go to the View menu, hide the Page Header and Footer and show the Report Header and Footer. Then set the Report's caption to "Current Poll Results" and the data source to "qryVoteSummary".

2 Add the following to the Report:

Report Header

	Name	lblHeading
	Caption	"Current Poll Results"
Label	Font Name	Arial
	Font Size	14
	Font Weight	Bold
	Caption	"Export Path:"
	Font Name	Arial
Label (Associated with txtFileName)	Font Size	10
	Font Weight	Bold
	Caption	"Vote Count:"
	Font Name	Arial
Label (Associated with txtVoteCount)	Font Size	10
	Font Weight	Bold

Report Detail

	Name	"txtFileName"
Text Box	Control Source	"FileName"
	Font Name	Arial
	Font Size	10
	Name	"txtVoteCount"
Text Box	Control Source	"Count010"
	Font Name	Arial
	Font Size	10

Report Footer

	Caption	"Total:"
Label (Associated with txtTotalVotes)*	Font Name	Arial
	Font Size	10
	Font Weight	Bold

	Name	"txtTotalVotes"
Text Box	Control Source	"=Sum(Count010)"
	Font Name	Arial
	Font Size	10

Save the report and use it as the basis for the generated XML report. But first, return to the form and add the code required to view it:

```
Private Sub btnViewReport_Click()
    DoCmd.OpenReport "rptVoteSummary",
        View:=acViewPreview
End Sub
```

You should now have a small database with two tables containing the vote data necessary to create the XML-based report. The XML report is made up of three parts. The first section is the XML, which contains the data for the report. Second is the XSL transformation document, which provides instructions for formatting the data. The final part is the HTML wrapper for the data, which presents data to the user. The method used to create the report is `application.ExportXML`.

Add the following code to the form:

```
Private Sub btnExportXML_Click()
    Dim sPath As String
    sPath = Nz(Me.txtPath, "")
    If sPath = "" Then
        MsgBox "Please enter a valid path",
            vbOK + vbCritical, "Invalid Path"
    End Sub
    Exit Sub
End If
On Error Resume Next
MkDir sPath
On Error GoTo ErrorHandler
```

This is where the data is actually exported:

```
Application.ExportXML _
    ObjectType:=acExportReport, _
    DataSource:="rptVoteSummary", _
    DataTarget:=sPath &
        "VoteSummary.xml", _
    PresentationTarget:=sPath &
        "VoteSummary.xsl", _
    OtherFlags:=acEmbedSchema
MsgBox "You successfully saved the
file in the folder:" &
    & vbCrLf & sPath, vbOKOnly +
    vbInformation, "File saved"
Exit Sub
```

ErrorHandler:

```
Select Case Err.Number
Case 2302
    MsgBox "The file was not saved.
    Check the path and try again.", _
        vbOKOnly + vbCritical, "File not
        saved"
Case Else
    MsgBox "There was an unknown error
    and the file was not saved.", _
        vbOKOnly + vbCritical, "File not
        saved"
End Select
End Sub
```

The majority of the code simply handles possible errors. The line containing the `ExportXML` method only requires a small amount of information in order to perform its function — the location and type of the Access Object to be exported. In this case, the `rptVoteSummary` Report is exported, but Tables or Queries could also be exported. The method also requires a Data Target, which is the destination filename for the XML data.

By including the optional

`PresentationTarget`, Access creates a style sheet that provides the HTML wrapper to the report. Excluding this value results in just the XML file being created. It's also possible to instruct Access to provide an ASP wrapper instead of HTML so it can be implemented by requests to the server. Alternatively, trying changing `OtherFlags` to equal `acRunFromServer`.

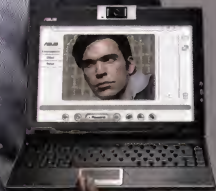
Compile the code and save the form. Open the report by clicking on the View Report button. You should see the movies in descending order of popularity. Now check the Export path and click on the Export XML button. You should receive a message telling you that the file was saved.

3 Open the Windows browser and find the location of the `VoteSummary.htm` page. Open the file with your browser. (If you are running Windows XP SP2 you may need to tell Internet Explorer to allow Blocked Content.) The page should be almost identical to the report and is ready to upload to your Web server.

4 You can also view the XML document to examine its structure through the Web browser. Alternatively, the new features incorporated into Microsoft Word 2003 allow you to view the XML document with the tags highlighted and a tree view representation of the document. [ETIP](#)



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A fresh outlook

Stephen Withers explains how VBA can be used to customise the functionality of Microsoft Outlook's Contacts list.

Providing a map matching details from Microsoft Outlook's Contacts file at the push of a button, MSN Maps & Directions (M&D) sounds too good to be true. But for those who prefer the good old UBD to M&D's MapScience offering, there is a way to make Outlook defer to Whereis (www.whereis.com.au) to give UBD junkies their map fix.

To get started, it's necessary to find out how to access information stored in Outlook, express the necessary transformation in Visual Basic for Applications editor (<http://msdn.microsoft.com/lsv/technology/vba/default.aspx>), and then persuade Windows to open the derived URL. You'll also need to know a little about using macros in Outlook.

The code fragments shown here should be read in the context of the full routine, which is provided on this month's cover DVD. The routine includes other basic code necessary to make the application run.

THE JOURNEY BEGINS

To help find your feet, locate an existing script that performs a similar task. Entering a search term like "Outlook VBA address" in Google should turn up some good examples.

The next step is to create a new application object to reference Outlook. Enter:

```
Set objOL = New Outlook.Application
```

It's a good idea to have the script work whether the active window is an Explorer (which shows a list of contacts) or an Inspector (which shows the details for one particular contact). The following piece of code sets `objItem` to the selected contact in either case:

```
Select Case TypeName(objOL.ActiveWindow)
    Case "Explorer"
        Set objItem = objOL.ActiveExplorer.S
        .Item(1)
    Case "Inspector"
        Set objItem = objOL.ActiveInspector.
        CurrentItem
End Select
```

To ensure the user really is looking at a contact, add the following code:

```
If objItem.Class = olContact Then
```

Once this is done, it's safe to access address properties. Since a contact can have home and business addresses, the sample `Whereis_script` verifies whether only one is non-blank. If so, the user must be asking for a map showing the other address, otherwise a `MsgBox` will let the user choose.

To access the individual fields of the business address, enter:

```
theStreet = objItem.BusinessAddressStreet
theSuburb = objItem.BusinessAddressCity
theState = objItem.BusinessAddressState
```

For the sake of this Workshop, all street addresses are 175 Castlereagh Street, though the sample `Whereis_script` on the cover DVD is more flexible and accommodates unit numbers, building names and so on.

Whereis needs the street number to be separated from the street name, so look for the first space in `theStreet`. Treat everything that comes before it as the number and everything following as the street name:

```
whereSpace = InStr(theStreet, " ")
theNumString = Mid(theStreet, 1,
whereSpace - 1)
theNumber = Val(theNumString)
theStreet = Mid(theStreet, whereSpace + 1)
```



Bonus DVD software

Whereis for Outlook script (see DVD for copyright requirements).

Skill level

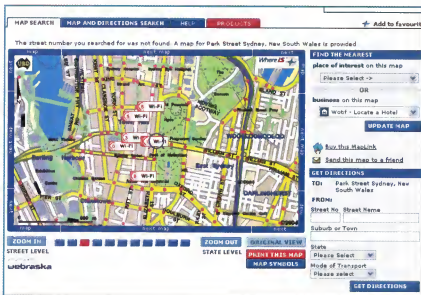
Intermediate

Requirements

Internet connection.

Time to complete

1 hour (approx)



UBD me: a map from Whereis can even pinpoint Wi-Fi hotspots in the area of your Outlook contact.

Converting **theNumber** from a string into a number is a quick way of forcing the value to be numeric, even if it turns out to be zero.

CLEAR DIRECTIONS

A **WhereIs** lookup requires a URL in the following format:

```
http://www.whereis.com.au:80/
whereis/mapping/geocodeAddress.do?streetNumber=175&streetName=Castlereagh+Street&suburb=Sydney&state=New+South+Wales
```

Most people use state and territory abbreviations in addresses, but **WhereIs** requires them to be spelled out in full. The **WhereIs_script** uses a simple lookup table to convert any abbreviations to full names. If the abbreviation isn't matched, the script assumes that what's entered is a full name, but you can do some error checking yourself.

Any spaces in the address elements have to be changed to plus signs (+) with statements such as:

```
theStreet = Replace(theStreet, " ", "+")
```

The required URL can be formed by stringing together the various constants and variables as follows:

```
theURL = "http://
www.whereis.com.au/whereis/mapping/
geocodeAddress.do?streetNumber=" &
theNumber & "&streetName=" &
theStreet & "&suburb=" & theSuburb
& "&state=" & theState
```

(Note that although the **theNumber** was previously converted from a string to a number, it's automatically changed back into a string.)

Now comes the real trick: opening a URL from a VBA script. Once again, Google can be used to find a script that performs a similar function.

The following sample found on the Internet included this method for opening an application, document or URL:

```
Private Declare Function apiShellExecute Lib "shell32.dll" _
Alias "ShellExecuteA" _
(ByVal hwnd As Long, _
ByVal lpOperation As String, _
ByVal lpFile As String, _
```

```
ByVal lpParameters As String, _
ByVal lpDirectory As String, _
ByVal nShowCmd As Long) _
As Long
Const WIN_NORMAL = 1
```

With those declarations in the script, the URL specified by **theURL** can be opened by entering:

```
lRet = apiShellExecute
(hwndAccessApp, vbNullString,
theURL, vbNullString, vbNullString,
WIN_NORMAL)
```

The primary benefit of using this method is that it automatically opens the URL in your default Web browser.

That's the basics of changing the map lookup in Outlook covered. For more advanced functions, the full **WhereIs_script** contains extra features that simplify installation by automatically configuring its toolbar button with the **WhereIs** logo (reproduced with the permission of **Sensis**). That section of code is liberally commented, so you should find it easy to navigate. [HTML](#)

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Mastering Linux, part 9

This month, Jarrod Spiga demonstrates how to install packages on a Linux system with Red Hat Package Manager (RPM) and Yellow dog Updater, Modified (yum).



Bonus DVD software

Fedora Core 4 • DVD PDF of this article and others in the series.

Skill level

Intermediate

Requirements

An installation of Linux (Fedora Core 3 was used in the writing of this article)
• a working network or Internet connection.

Time to complete

3 hours (approx)

In this series...

Part 8 — July '05

On the cover DVD

Part 9 — August '05
Installing software

Part 10 — September '05
Mastering Linux itself!

... and more

Why spend hundreds or even thousands of dollars on fancy boxed software packages when there are often open source equivalents readily available for little or no cost?

For the most part, finding the software is easy. The biggest hurdles are encountered when it comes to installing packages, since the process is a little more involved than running setup.exe. It can be difficult getting your head around managing prerequisite, co-requisite and conflicting packages, let alone compiling your own applications. But there are tools available to make things easier.

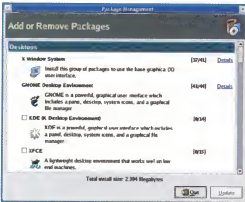
ADD AND REMOVE PROGRAMS

Part of the reason why Fedora Core 3 is a four-CD download is that the distribution ships with an extensive array of popular software packages. Most aren't automatically installed in order to conserve disk space, but all are readily accessible from the CDs should you need them.

1 The quickest and easiest way to check what's on the CDs is to use the Add and Remove Software tool, located under GNOME > System Settings. If you aren't logged in as the root user, you'll be asked for the root password to continue.

At launch, the tool scans your system and compiles a list of the software that's already installed. Then the Add Package Groups screen appears.

To add or remove packages, you'll have to drill down into the relevant group by clicking on Details. Ensure all checkboxes for the applications you want to install are ticked.



1 **Pick a package:** many software applications can be installed on your Linux system using the Add and Remove Packages tool.

Some packages within program groups won't have checkboxes next to them. These are usually prerequisite packages which must be installed for that program group.

After selecting the packages you want to install, hit Install Packages at the bottom of the Add and Remove Software tool. Confirm your selections at the dialog to begin the install. You may be asked to insert the installation media into your optical drive during the procedure.

2 After adding the packages, run up2date and download any updates that have since been made available for the newly-installed applications. The sole drawback to installing from CD is that you don't always have the latest, most secure versions.

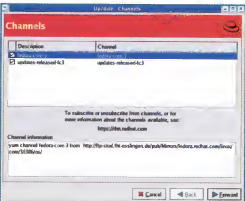
A TASTE OF YUM

The Add and Remove Software tool only lists the packages bundled on the Fedora Core 3 CDs. There are hundreds of other applications downloadable via the Yellow dog Updater, Modified (yum).

Yum is an automated update and package installation application for RPM-based systems (including Fedora) that runs at the command line. Its main purpose is to determine all the dependencies for packages being installed or upgraded, and to figure out the best order in which to install those dependencies so everything works.

Configuring yum was explained in part one of this series (APC December 2004, page 98). The explanation has also been included in PDF format on this month's cover DVD.

3 To download and install software using yum, you'll need to know the name of the package you want. You can use the `list` argument to the `yum` command to guess package names, but it can take some time for online repositories to tell you whether you've guessed correctly.



2 **Always update:** after installing packages from CD, it's a good idea to run up2date to ensure that those are the latest stable versions.

A better way is to create a single file with a listing of all of the packages available. To do so, bring up a command prompt and run as the root user:

```
yum list available > ~/yum-list.txt
```

To search through a list of packages, simply run the following command:

```
cat yum-list.txt | grep <name>
```

where <name> is part of the name of the packages you're looking for.

The advantage of using yum is that you'll always download and install the latest version of the package — there's no need to update after installation. Better still, when future versions come out, you don't have to do anything more complicated than run `update` again.

RPM

Even though the yum repository contains thousands of software packages, you may come across an application that's not available for download via yum.

Many developers package software for download in RPM format — the same format as yum. However, installing an RPM is more involved than using yum because you have to download all of the required packages and resolve any dependencies or conflicts manually before installation.

4 Installing and upgrading RPM packages from the GUI is very simple — just navigate to the location of the appropriate RPM package and then double-click on it. If you're not logged in as root, you'll be prompted for the root password in order to proceed. Your system will then check to see what prerequisites are needed.

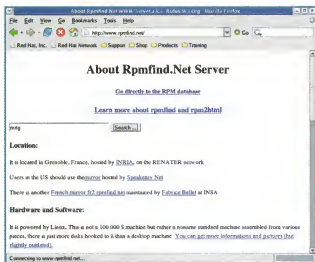
5 Once this evaluation is complete, a dialog will appear that reports how many packages will be installed, and how much disk space they will consume. Select continue and Fedora installs or upgrades everything, including the prerequisite RPM files (providing Fedora can find them).

If Fedora can't find any required RPM files, an error message pops up displaying the packages that can't be located. You'll need to resolve any failed dependencies (see "Failed dependencies", right) before the installation will succeed.

You can also install RPM packages from the command line. The `rpm` command can perform a variety of tasks — running

`rpm --help` from the command line lists the functions available.

The following command line can be used to install a package via RPM:



Package hunt: rpmfind.net is an array of mirrors containing thousands of applications packaged in RPM format, ready for your FC3 system.

```
rpm -Ivh <package name>
```

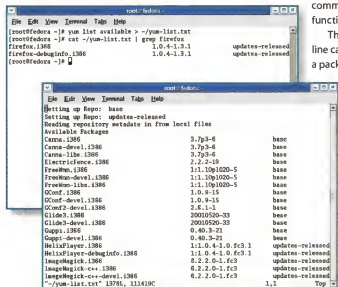
where <package name> is the name of the package(s) that you're installing.

In this example, the `v` switch to the `rpm` command provides more detailed output. Without it, the `rpm` command only displays errors encountered. The `h` switch prints hashes (#) as a pseudo-progress bar at the command line, giving you an idea of how the installation is proceeding.

A similar command can be used to upgrade packages, though you'd use the `U` (for upgrade) switch instead of `I` (for install).

FAILED DEPENDENCIES

Managing dependencies is one of the more difficult tasks when installing RPM packages. In extreme cases, you'll need to satisfy a number of prerequisites to install



3 List all that's yum: saving a list of all available yum packages makes far speedier searching in the future.



4 Quick and easy: installing RPM packages is too easy when using the GUI — provided X-Windows can find all the required packages.

► a package, but some of those prerequisites have prerequisites of their own.

If you have failed dependencies, the first place to look is on the Fedora CDs. Insert the first Fedora Core 3 CD and, at a command line, mount the disk by entering:

```
mount /mnt/cdrom
```

Search for the required RPM by typing:

```
find /mnt/cdrom -print | grep <dependency>
```

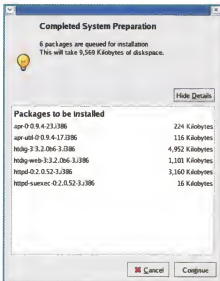
where `<dependency>` is the name of the dependency you're looking for. If you find it, copy the relevant RPM files to the same location as the RPM. If you don't find the dependency, unmount the CD-ROM:

```
umount /mnt/cdrom
```

and search the next CD. If you've searched every CD and still can't find the dependency you're looking for, there are a number of online RPM libraries that can be searched, such as www.rpmfind.net.

CONFLICTS

Occasionally, you may encounter a conflict when installing or upgrading software on a Linux system. For instance, RPM might inform you that if you install a new version of Perl, a number of applications you've already installed won't work properly with the newer version.



5 Automatic installs: when installing RPMs from the GUI, any dependencies that aren't installed are automatically added to the installation list.

Conflicts such as this can be very difficult to resolve. Generally, you'll need to source updated versions of all affected packages in order to get the installation to proceed.

BUILDING AND COMPILING

Almost every application under Linux can be compiled directly from source code, even if RPMs are available. Most applications for Linux are written using the C programming language, and the GNU Compiler Collection (GCC) is used to build and compile them.

This process usually involves three steps:

- **Configuration:** making customisations and applying any settings to the package.
- **Building:** the actual compilation of the source code and your configuration to create the executable files and data that make up the application.
- **Installation:** copying the executable files and data to appropriate locations on your file system.

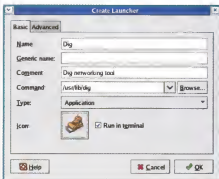
You'll usually download the source code in a gzipped tarball format — a format similar to a ZIP file that carries the TAR.GZ extension. To extract the source file from the gzipped tarball, you could run:

```
tar -zxvf <name>
```

where `<name>` is the name of the downloaded gzipped tarball.

The source code for most applications contains a file called `INSTALL`, which usually contains specific instructions on how to build that application. In general, you can configure the application by switching to the directory where the source code is located and entering:

```
./configure
```



6 Icon do that: Linux installers generally don't add program groups to X-Windows. You'll need to create launchers to start applications at the click of a button.

A configuration script should run, perhaps prompting for certain pieces of information necessary for compilation. After configuration, build the application by running:

```
make
```

Don't expect to understand a lot of the output — it's often useful in debugging a compilation, but will only be of use should your build fail.

Once your system stops processing code, look at the last few lines of output. If you see any errors, the build has failed. You'll need to rectify these errors before running the `make` command again. In most cases, failed builds are the result of missing prerequisites or a bad configuration. In both cases, refer to the `INSTALL` file.

GET GOING

Once you have a successful build, copy the necessary files to working locations by typing:

```
make installStart me up
```

When you install an application in Windows, the installation routine usually creates a new program group and icons for your application in the Start menu. In Linux, you'll need to create an icon under the GNOME menu.

■ **Making an application launcher is easy.** Simply right-click in an empty area of the taskbar and choose `Add to Panel > Custom Application Launcher`. A dialog box appears in which you can enter in the details of the appropriate application.

The Name and Command fields must be completed in order to create the button: the latter must contain the full path to the application (the Browse button may help you fill in this detail correctly). Alternatively, enter a command line argument in this field to alter the way the app behaves. Configure an icon for the application if required.

Naturally, the Run in terminal checkbox should be selected if you're using a command line app — you won't see much output if you don't. Click OK and your new launcher should be ready to use. [FIG 11](#)

Next month ...

Next month's instalment of Mastering Linux takes you back to the shell and explains some of the more powerful commands. The Workshop also guides you through the process of creating your first shell scripts.

SONY

Feel the need for speed?



Turbocharge your back-up

Delivering increased speed and higher capacity, AIT Turbo tape drives and media are the latest progression in Sony's data storage roadmap. AIT-1 Turbo delivers 6MB/sec and 40GB compared to its predecessor which delivers 4MB/sec and 35GB. While AIT-2 Turbo delivers 12MB/sec and 80GB compared to its predecessor offering 6MB/sec and 50GB. Turbocharge your back-up with Sony's reliable AIT Turbo solutions. Visit sony.com.au/datastorage or call 1800 017 669.

IT'S A SONY





Downtime

High-performance playtime

Astone Versa 200 foldable travel speakers

▲ Upsides: foldable. They work with any MP3 player.
▼ Downsides: the crummiest, cheapest, nastiest speakers ever built. They boast "two watts of total power". Impressively awful sound quality — a peak-hour traffic jam. They come with a cardboard iPod. But wait, it's not an iPod, it has some extra buttons Photoshopped on to avoid legal action from Apple. There's no dock connector and earplugs aren't included.



Details

Online www.astone.com.au

Price \$49.95

Verdict ★★★★★

Solio solar iPod charger

▲ Upsides: cleverly designed solar iPod charger has its own built-in battery so you can charge it while disconnected from the iPod and then juice up quickly. Internal battery can also be recharged using mains power. A large range of additional connectors can be purchased to charge other devices, such as mobile phones. Charging of devices goes at the same speed as a normal charger.
▼ Downsides: the \$189 retail price is steep. Internal battery requires between eight and 10 hours of direct sunlight for a full recharge. Additional connectors can only be ordered from overseas.



Details

Online www.innovision.com.au

Price \$189

Verdict ★★★★★

Nokia N91

▲ Upsides: Finally, a mobile phone with a hard drive — and 4GB at that. Over 12 hours of battery life is good for an MP3 player. Stainless steel casing. Built-in Wi-Fi and Bluetooth.

Drag-and-drop music files to the hard disk via USB 2.0. No more fiddly Nokia file

uploader software.

▼ Downsides: €700 asking price (that's around \$1,100). Only 12 hours of battery life is awful for a phone.

Online: www.nokia.com.au



Preview

Logitech Harmony 688 remote control

▲ Upsides: USB-connected universal remote control that doesn't require "learning" — just select the brands and models of your home theatre components on Logitech's Web site and upload to the remote. Impressive range

of infra-red profiles available, including those for popular Australian brands such as Zensonic and Topfield.

▼ Downsides: local pricing has yet to be announced, but the model below it costs \$345.95. Yikes.

Online: www.logitech.com



SNEAK PEEK

Jabra BT800 Bluetooth headset

▲ Upsides: Bluetooth headset for your computer (for VoIP) or mobile phone. Comes with a calling line identifier display, though this is of dubious value given that ears don't have eyes.

▼ Downsides: why is anything Bluetooth so insanely expensive? Sits a bit too loosely for comfort.



Details

Online www.jabra.com.au

Price \$199

Verdict ★★★★★

O'Neill H2 backpack

▲ Upsides: now you can recharge your iPod and mobile phone simultaneously using this backpack's solar panels. And built-in Bluetooth (seriously!) means you can use a Bluetooth headset for both functions (when you get a phone call, the iPod is automatically paused).

▼ Downsides: only available in Europe at the moment. Price yet to be announced, though O'Neill will likely charge a premium for this technology. Which means you may have to choose between gold-plated ski boots and the O'Neill H2 this year.

Online: www.oneilleurope.com



Coming soon

LEGEND Downtime ratings

uber

Super, super cool

1337

Super cool

noob

Uncool, (as in newbie)



Preview

Atari Flashback 2

▲ **Upsides:** it's the original Atari 2600 re-released! Now you can experience the chunky goodness of 40 original Atari games

like Pong, Breakout, Canyon Bomber, Asteroids and Centipede on your home TV, without worrying that a 20-year-old capacitor is going

to explode and spray acid on your baby sister's face. The price of the Flashback 1 is \$79.95, but a price for the Flashback 2 is yet to be set.

▼ **Downsides:** none! It's cheap, it's cheerful, the controllers are faithful to the original design and it has wood grain panelling. What more could you want?

Online: www.atari.com.au

StealthSwitch

▲ **Upsides:** if the boss walks up behind you while you're battling Windows Solitaire, or are in the middle of a steamy chat in #hottub on IRC, simply tap your foot and the boss key software will take a preconfigured action, such as changing to a planning spreadsheet and maximising it.

StealthSwitch can also mute the sound, hide the taskbar, hide all desktop icons, and password-protect the restore function instantaneously. Then, with one click of the foot-switch, you're back in chat. We could tap our foot all day and never get tired of it.

▼ **Downsides:** your boss may be fooled, but your work output never lies. You've been warned.



Details

Online www.stealthswitch.com

Price US\$52.95 (including shipping)

Verdict



Uned X15eIR

▲ **Upsides:** a home theatre PC case with a 17in TFT monitor built in. Unless you're part of the champagne-in-your-veins 'digitari' who can afford a plasma display, it's a pain to turn on your TV just to browse your music library, for example. This ATX case features all the grommets you need to eliminate vibration noise and comes with the excellent IR Trans software that works for both Windows and Linux with any remote control.

▼ **Downsides:** runs at an unusual 800 x 480 resolution, though it handles higher resolutions quite well. Looks great, but it's bloody dear for a case.

Details

Online www.zylux.com.au

Price \$899

Verdict



Logitech MX518 gaming mouse

▲ **Upsides:** forget the two-button, beige, lint-collecting mice of the past. Logitech has served up the space-age MX518 with its super-comfortable grip and ridiculously high 1,600dpi resolution. Gamers can also switch the resolution on-the-fly from sniping mode to map

running. And if you were the kind of kid who liked pressing the buttons for all 37 floors in a high-rise lift, you will love the seven buttons on the 518.

▼ **Downsides:** left-handers will get very sore, very quickly. Based on infra-red, not laser.



Details

Online www.logitech.com

Price \$99

Verdict



Smallest Linux PC ever

Holy moley! German company Kleinhenz Elektronik has created a PC that runs Linux in a box only a tad bigger (3.5 x 1.9 x 1.9cm) than an RJ45 wall connector. The uLinux kernel 2.4.27 runs on an ARM7 CPU at 55MHz in the available 2MB of memory. They've even shoehorned in a 10/100Mbit Ethernet port, and a wireless version that will be just marginally longer is planned. How much would you expect to pay for this major feat of miniaturisation? Not \$2,000, not \$1,000, but only €284 (approx \$445). Early adopters will have to program their own apps in C, C++ or dearly beloved Fortran.

Online: www.picotux.com



NanoCoolers liquid metal CPU cooling

So you want a sleek Apple PowerBook, but you're not prepared to cough up several thousand dollars for a notebook based on an outdated G4 CPU? The answer to Apple's heat dissipation woes might be Intel, but it might also be liquid metal cooling. US company Nanocoolers has devised a cooling system that pumps liquid gallium (which has a boiling point of 2,000°C) using only magnetism. This technology is silent, more efficient than liquid cooling ... and very, very patented.



Cover up: "There were no bras in mediaeval times, so there are no bras in Mediaeval Times."



Celebrity skin: Snuffleupogus is about to get turned into a handbag.



Rave on: there's always someone who overindulges at a dance party.

Guild Wars

Not an FPS, not quite a large-scale online RPG, *Guild Wars* proves fence-sitting can work. *Justin Kranz* joins the quest fest.

The lowdown

▲ **Upsides:** impressive guild combat flexibility; lack of monthly fees.

▼ **Downsides:** online RPG lite — big population, but no large group adventuring.

Details

Contact	NCSoft
Online	www.guildwars.com
Price	\$99.95
Verdict	★★★★☆

Critical to the success of massive multiplayer online games (MMOG) is the size of the gaming population and the fee scale. If you charge too much for monthly access, the masses will stay away. And if you don't have a large population, nobody will want to join.

Guild Wars has stiff competition in the fantasy online role-play stakes. *EverQuest* and *EverQuest II* have made Sony Online Entertainment a motza from monthly fees. Blizzard's *World of Warcraft* has taken the genre to a whole new level — that game's sales have exceeded 1.5 million since December 2004, and are soaring towards the two million mark. That's a lot of people paying around \$15 a month to play.

But *Guild Wars*' all-star developer, ArenaNet, has thrown a wolf into the henhouse. You see, the game has no monthly charges — just buy a copy and you're entitled to run riot in the *Guild Wars* universe.

It's a bold, smart tactic when you have to play catch-up with the competition. *Guild Wars* is visually on par with *World of Warcraft*, which in turn makes *EverQuest* look tired. So there's no software reason to not try the game.

Too good to be true, right? Kind of. *Guild Wars* takes a few short cuts that gamers will either love

or hate. For starters, once you leave the built-up (safe) urban environs, you won't encounter other parties or individuals just hanging around. You and the members of your party (single digit numbers only) load the relevant quest and go through it in isolation. Which is fine for players who like to get into straight-up adventuring, but those who enjoy finding other human beings in strange places may feel their playing experience is a trifle linear.

Player-on-player combat is interesting because it's heavily controlled. You can enter prescribed arenas for some gladiator-style match ups, or head into full-on guild combat for kudos and rankings. The lack of freedom in this approach is balanced by an outstandingly easy-to-use combat system and some FPS-style combat modes, including the capture the flag and king of the hill variants.

Guild Wars' lack of a monthly fee is, on balance, equitable. You're not getting the population or freedom experienced playing the likes of *Warcraft*; it's a more intimate experience, based around smaller groups. Don't come here if you're looking to team up with 50 or so like-minded folk and lead a raid on your enemies' strongholds. Rather, it's an FPS-style, limited numbers, organised match-up with some questing on the side. But if you long for a taste of what online role-playing can be without the monthly cash drain, it's a great little number.

TrackMania Sunrise

Step back in time to when games were under \$50, less glamorous, and simply fun to play.

There's something inspiring about seeing the battler get up. Case in point, *TrackMania Sunrise*. Inexpensive (not "cheap") and cheerful, the game is a classic case of KISS.

This racing game has no complicated upgrade paths, and no NASA science controlling the atomic-level friction of tyre particles against road surfaces, just more speed-driven ecstasy than you'll be able to find anywhere this side of schoolies week.

TMS has enough eye candy to make you appreciate the game's design, but not overdone to the point that it chokes your PC. For gamers on more modest rigs — sub-2GHz CPUs and 32 to 64MB video hardware — this is a rare example of quality programming that's friendly to a lower spec. Of course, if you're running a high-powered rig you can turn up all the fruit and it looks magic.

Simply, the developer realised that as impressive as it is to have realistically mapped terrain and trackside features, the only time you really get a chance to notice it is when they're stationary. Which isn't an ideal state in a racing game.

Pariah

Finally, a case of truth in advertising.

It takes a great deal of moxie to give your game a title that has negative connotations. And let's face it, "Pariah" doesn't exactly fill you with confidence, does it? Admittedly, it's not as bad as being named "Steaming Pile" but even so, surrounded by games with titles that include words such as "Unreal", it does look a little pessimistic.

With good reason, as it turns out. The primary complaint lies with Pariah's engine. It's a modern version of the Unreal engine — a commonly used graphic powerhouse, with a great deal of scalability across differing specs. But in the case of Pariah, the designers were obviously so impressed with the look of Unreal 2004 they didn't really spend much time altering things. So its terrain looks spookily similar to UT2004's, while the characters look different, only worse. Ouch.

So perhaps the playing style is different? Well, it is, but not in a good way — it's actually slower than the game that inspired it and the netcode, so critical in fast-action shooters, is poor too. Weapons lack impact, and half the time online you won't know if it's your aim, the game or merely the dodgy weapons that are so caprulent.



Loopy: "Hey Frank... are you sure this is the way to the servo?"



Up, up and away: if you think this looks precarious, try it at full speed.

Instead of making the tracks pretty to look at, in *TrackMania Sunrise* they're amazingly fun to drive on. Reality is sidestepped via loop-the-loops, massive jumps, even the chance to skip like a stone across expanses of water. It's difficult, unforgiving, very addictive and includes prominently placed restart and reset position controls for the very simple aim of perfection through trial and error.

It's not just straight racing — there are also puzzle-based modes, and an online mode. In all cases, your rival cars are transparent and don't affect your vehicle even if they overlap it. Given the vagaries of internet gaming, this is understandable.

TrackMania Sunrise doesn't pretend to be the second coming for racing sims, it's just an addictive, fun and cheerful arcade blast.

The lowdown

▲ Upsides: eye-meltingly fast, great attention to detail, and plenty of offbeat racing modes; great online.

▼ Downsides: no vehicular collision available — even as an option; can be quite difficult.

Details

Contact	QV Software
Online	www.trackmania.com
Price	\$49.95
Verdict	★★★★★



Fly, you fools: we feel your pain, brother — we wouldn't want to hang around either.



Unpolite-able: any colour you like, as long as it's tan, brown or rust.

Couple this with a story-line that jumps more than a Crusty Demon and you have a recipe for a big fat mess. Apparently you're a doctor whose screw-ups have seen him assigned as nurse to a virus-laden patient due for transportation. When your transport gets shot down, your charge heads for the hills, with you in hot pursuit. And that's about the point where logic surrenders to the cruel mistress that is game development pragmatism and tough deadlines.

Pariah's action and sequencing isn't aided by the fact that it's also a console release title. Too many compromises have been made in the way the game unfolds, along with its derivative look and dodgy execution, to make it worthy of anything more than a bargain bin purchase at best.

The lowdown

▲ Upsides: if you haven't spent money on it, that's good...

▼ Downsides: ...if you have, that's bad.

Details

Contact	THQ Software
Online	www.pariahgame.com
Price	\$89.95
Verdict	★★★★★

Top five fastest games of all time

Sometimes, you just feel the need for speed. Across their genres, these babies are simply *los mas rapidos*.



FPS **QUAKEWORLD**

The original Quake was impressive, but playing it online was often as much fun as being tarred and feathered. That all changed with the introduction of QuakeWorld. The main improvement came with "client-side prediction" — where the game client intelligently "guessed" where other players would be in the next few milliseconds — which allowed for much smoother gameplay.

An interesting side effect was in the game's physics. Running and jumping with precision movement allowed you to accelerate to insane speeds — as long as you could maintain your rhythm. What was already a blisteringly fast game turned into an experience that only the most gifted FPS players could master. To date, no game has even come close for speed and simplicity.



STRATEGY **STARCRAFT: BROOD WAR**

Many a real time strategy player was scarred for life when they first ventured online to Blizzard's Battle.net to dabble in this RTS immortal. StarCraft is the fastest because veteran strategy players took the rushing tactic that worked so well in games such as Command and Conquer: Red Alert and transplanted it wholesale to the game.

Spewing out large numbers of weaker units and unleashing wave upon wave onto your hapless enemy has never been finer. And while Warcraft III still enabled such tactics to thrive, there was never that same level of cachet associated with it. The highest gaming accolade occurred when "zerg rush" (named after one of the game's races) entered gaming's leet-speak idiom.



SPORT **KICK OFF 2**

Anyone who believes that soccer players are cocaine snorting slob who couldn't run down a cliff face never saw this Amiga classic in action. The pulled-back overhead view made the sensation of speed even greater, and whipping the bullet-paced ball around the park took the kind of reflexes boasted only by scalded cats and 13-year-olds. Why? Because the ball wasn't "stuck"

to the players' feet. Rather, it took constant adjustments — all at a velocity that seemed like 200km/h — to even retain possession.

Goals were few and far between, not because of limited opportunities but due to the need for sustained, jet fighter-style hand-eye coordination. The rarity of the event made hitting one into the old onion bag deeply satisfying... and the stuff of many extended magazine tips articles.



RACING **NEED FOR SPEED UNDERGROUND**

The only "modern" game on the list reflects just how gaming has changed over the last decade or two. Racing games are obvious contenders for any speed and reflex crown, but the breakthrough of the Need for Speed franchise into urban racing amounts to a rarity nowadays — a game that balances glorious visuals with scary pace. Twitch the wrong way and you'll end up hurtling into

other vehicles or scenery before you can blink.

True, the action is inspired heavily by the likes of *The Fast and the Furious*, and there is a superior sequel, but there's much love for any developer willing to revert to the "speed is king" days of old-school racing. Along with TrackMania Sunrise (reviewed page 123), this is the premier PC racer for those hoping to enjoy the true "eyeballs stinging from not blinking" effect.



PLATFORM **MONTY ON THE RUN**

Twenty years ago, when platform games were king, Commodore 64 gamers were coming to grips with some excellent titles — and this was a gem. Insanely hard, 2D, and with a violin synth loop that stayed in your brain long after you shattered your joystick in frustration, Monty On The Run was straight-up lightning. Sure, certain console platform games in the '90s have gone

faster, but they usually relied on suspense or minimisation of control from the player when they did so. Monty was just flat-out, unrelentingly fast.

An instant classic, it became the kind of title that functioned as a mark of your C64 gamer credentials. Anyone could complete classics like Uridium, but you knew you had a real fanatic on your hands when you found someone who claimed to have finished this baby.

NAVMAN

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with embedded
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GPS 4420

Supports:
HP iPAQ/i-mate/
Asus/Toshiba/XDA II
and HP rx 3715
running windows
mobile 2002 or
2003.



HP rx 3715



XDA II / i-mate



HP 4150*



Toshiba e750

Get the most out of your handheld with a GPS4470/4420 from Navman. Providing the ultimate, cable free in-car navigation experience for Bluetooth enabled handheld users, including Palm T series, Treo650, T3 & T5, Palm Zire 72 and latest Sony Clíés running OS5. *Also PocketPC's running Windows Mobile™ 2002 or above e.g. HP iPAQ's Toshiba, XDA II / i-mate, Asus.

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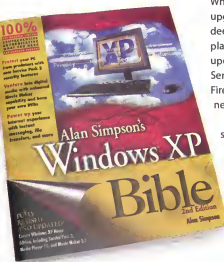


For more information, contact:
Navman Australia
(02)9879-9000

www.navman.com

email: pcnsales.aus@navman.com

Alan Simpson's Windows XP Bible 2nd Edition



Details

Publisher	John Wiley
ISBN	0764578154
Price	\$49.95

Whether you're finally taking the plunge and upgrading to Windows XP or simply want to dig deeper into the operating system, this is a great place to start. The *Windows XP Bible* has been updated to include the features of Windows XP Service Pack 2, including the revamped Windows Firewall, Automatic Updates, improved wireless networking and Bluetooth capabilities.

The first two parts of the book cover the basics such as interface and customisation procedures, showing that there's more to it than just using visual styles and changing desktop wallpaper. There's an excellent introduction to managing user accounts and configuring language and accessibility options, and details on the little-known Windows speech and handwriting recognition engines built into Microsoft Office XP and Office 2003.

File system operations are explained, providing an in-depth look at Windows Explorer configuration settings, shortcuts, disk and file compression, backups and CD/DVD burning. A further chapter is dedicated to printing and faxing, covering common tasks such as installing, sharing and troubleshooting

printers. This is followed with step by step guides to offline printing, Internet faxing and printing to disk.

The *Windows XP Bible* offers an exhaustive look at security and the Internet, with particular attention paid to getting the most from integrated Windows software. Wherever appropriate, the book also investigates the use of third-party applications to tackle issues not innately addressed by the operating system. However, one glaringly obvious omission is any discussion of alternative browsers and the risk of browser hijacking in Internet Explorer.

Creating and playing back digital media is discussed, along with installing and uninstalling software, troubleshooting hardware and performance issues. These aren't advanced chapters, but they do describe fundamental tasks like performing driver upgrades, rollbacks and using system restore points.

The final chapters on home and business networking provide all the information you need to get Windows XP up and running with broadband, file and printer sharing, and wireless connectivity. Overall, this is a rock solid reference for all XP users.

Daniel Winter

Computer Networking Illuminated

Computer Networking Illuminated is an excellent text for those wishing to learn about networks and data communications. It covers a broad range of topics, including data encoding and decoding, infrastructure and network protocols, naming and addressing, network security and networking standards. Signalling, error detection, the OSI reference model, network design and topologies, routing and many other important concepts and ideas are all explained very clearly.

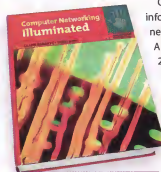
This book is very approachable and, unlike many other books on networking, has an engaging style. The chapters are logically structured and well thought out, with many pictures to illustrate the information being explained. Readers can test their knowledge via the included questions and exercises.

One small criticism is that not enough information is given about various network operating systems (NOS).

A lot is written about Windows Server 2000, but there's very little about Novell and Linux. However, it doesn't mean that the book skimps on detail. The level and amount of information is appropriate for the book's target audience, and information pointing to online resources is also included.

You don't have to be a computer science student to enjoy *Computer Networking Illuminated*. It's highly recommended for anyone who wants to learn about networks.

Peter Sbarski



Details

Publisher	Jones and Bartlett
ISBN	0763726761
Price	\$100

Degunking eBay

Like other books in the *Degunking* series, this is all about streamlining processes to help you work efficiently. Some of its suggestions, such as those relating to topics like dealing with spam, cookie management, phishing and finding text on a Web page, are generic and can be found elsewhere. And proficient Google users will probably be familiar with most of this book's search tips, though there are a few helpful items such as wildcards, the OR operator and saved searches.

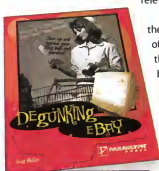
More specific ideas include tips for winning auctions (knowing the value and the competition), advice on being a good seller and building a positive reputation, writing effective copy, designing listings and using templates. The degunking process even includes identifying the clutter around your home and disposing of it via eBay. All this is relevant regardless of geography.

The shipping tips relate directly to the US Postal Service, and are therefore of little use to Australian readers, though some of the principles can be usefully applied.

While some of the material is really only suitable to those running an eBay-based business, much of the advice is beneficial to the casual buyer or seller.

On the whole, *Degunking eBay* is a very useful book. But perhaps the ultimate test is whether a reader can recover the cost of purchase by striking better deals!

Stephen Withers



Details

Publisher	Paraglyph
ISBN	1932711999
Price	\$39.95

Wireless All-in-one Desk Reference for Dummies

This title is more of a background and tutorial covering various wireless technologies from GPS to Wi-Fi than a "desk reference".

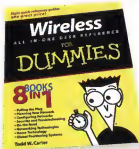
Wireless All-in-one Desk Reference for Dummies would be a useful book for beginners if it weren't so US-centric. In particular, the descriptions of wireless Internet access options, mobile phones and HDTV aren't appropriate for Australian readers. Microsoft SmartWatch, the Family Radio Service and TiVo are also irrelevant here. There's no mention at all of the increasingly popular DECT (Digital Enhanced Cordless Telecommunications) cordless phones.

It's not all bad. The tips on selecting, setting up and troubleshooting Wi-Fi hardware are useful, security is given due consideration, there's some worthwhile material on basic network functions (such as sharing files) and Bluetooth is well covered.

Other products described include Pocket PC, Palm, BlackBerry, media players, media servers, wireless mice and other peripherals.

There are plenty of clear illustrations and screen shots, but some of the photographs have been reproduced poorly in monochrome.

Stephen Withers



Details

Publisher	Wiley
ISBN	0764574965
Price	\$49.95

Introduction to Programming with Visual Basic .NET

This book was written specifically for Visual Basic .NET programmers with no prior experience, and it will serve them admirably.

Topics covered include: working in the IDE; designing forms using visual components; responding to events; working with primitive data types; handling basic user interaction; conditional statements and branching; looping; procedures and functions; scope; arrays and algorithms; database integration; SQL; file handling; ASP.NET; and classes.

This gives *Introduction to Programming with Visual Basic .NET* excellent depth, with material not

usually included in introductory texts but which is highly relevant to the construction of functional software. At the conclusion of each chapter, a "real world" application is explained, giving immediate practical exposure to the concepts discussed.

Disappointingly, the "Tips from the pros" usually fail to explain best practices for new programmers. Also, beyond constructing your own data types, there's no real coverage of object-oriented design.

That aside, its sound instruction will give beginners a solid grounding in Visual Basic .NET.

David Williams



Details

Publisher	Jones and Bartlett
ISBN	0763724785
Price	\$99.95

Beginning JavaServer Pages

Beginning JavaServer Pages is an outstanding work with a solid emphasis on the correct way to write code. It clearly explains design patterns, testing, model-view architectures and many other important considerations in good software engineering.

This is not just a "sequence, selection, repetition" work, but one which distils years of experience. Any reader can have confidence that after finishing they will be not just a JavaServer Page (JSP) code cutter, but a professional developer with a mastery of principles that transcend language boundaries.

Part one covers JSP fundamentals. Part two builds on this by putting the JSP language

knowledge into the framework of modern Web server software development, including coverage of servlets, security, performance and database integration. Part three brings it all together by showing how to build two real world applications — a personalised Web portal and an updateable, data-driven shopping cart site. Part four concludes with appendices and exercise answers.

This title is comprehensive and complete in its coverage of JSP. It doesn't make any assumption of previous programming experience, or bog down experienced programmers with basic fundamentals.

David Williams



Details

Publisher	Wrox Press
ISBN	076457485X
Price	\$66.95

Windows XP Timesaving Techniques for Dummies

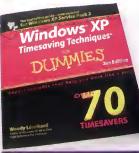
The second edition of this popular title has been refined and updated to cover Windows XP Service Pack 2. Aimed at beginners, the book features useful details about the Desktop, Start menu, Taskbar, removing programs, cleaning up old icons, creating shortcuts, using Windows Explorer and searching for files. It also covers applications such as Internet Explorer, MSN Messenger, Trillian, Outlook Express and Windows Media Player.

The multimedia chapters are also comprehensive, while the security section covers viruses, firewalls, spyware, cookies and adware, along with tips on

setting up a network and sharing files. Other subjects include keeping Windows in check, making backups, using remote assistance, installing drivers, general troubleshooting tips, System Restore and lost password retrieval.

While this barely scratches the surface of Windows XP *Timesaving Techniques for Dummies* content, the question remains: do you need this book? Answer: APC readers will likely find it too basic. But if you know someone who's just beginning the journey, it's recommended (along with a subscription to APC).

APC staff



Details

Publisher	Wiley
ISBN	0764578839
Price	\$44.95



HOLY HOFF WATCH!



Last month's calls for Hoff media brought out the Hoffamaniacs in APC readers. Half of you sent in the 2MB PPS Best Of, which has some Hoffastic pearlers such as the Half-Life parody HoffLife2, Hoff to do us proud on ANZAC Day, Ferris Bueller's Day Hoff and a million more.

Benjamin Payne went the extra mile and created his own Hoffice Space rip off from the awesome movie Office Space. Denise Freiburger, Jamie Burton, Benjamin Barnes sent in the most wicked with the Hoff soap dispenser. Mathew Holko earns a salute for 6MB worth of Hoff. But Jason Bruggemann takes APC's Hoffmentalist crown for 7MB of pure Hoff.

YOU WILL USE ATRAC3

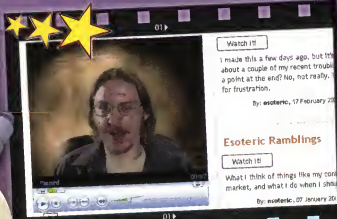
Soon those voices in your head could really be the work of a multinational corporation. Sony recently filed for a US patent for using ultrasound to stimulate areas of the brain, allowing the zap-ee to experience sights, sounds and tastes that don't actually exist! Chip Chat's greatest fear is that if Sony gets the technology to work both ways, the music industry might start charging royalties for that song stuck in your head!



GARTH WITH HAIR!

It's not wise to sneak an item into the magazine accusing your editor of looking like a nerd and of having put on weight in recent years (APC July, page 128). Editors don't become editors by being nice guys. It just so happens APC's editor, Tony Sarno (right) has located a picture of deputy editor Garth Montgomery when hair follicles last lived on his head, at the ripe old age of 20!

There were too few good hair days like this <sniffle>... — GM.



REVENGE OF THE VIDEO NERDS

While celebrity-obsessed teens bask in the bling of pop idols like Beyoncé and The Killers, self-professed nerd "Starius" has struck a blow for celebrity starved geeks. A new video blog, humbly dubbed "The Esoteric Ramblings of Starius" (<http://www.vlog.com/portal/index.php?blogId=8>), is now pumping out geek musings on such exhilarating topics as his "pain in the ass workstation", and why there are two different PCI Express power formats. The lank and greasy hair is grungey, the zits a by-product of geek gourmet pizza (which we heartily commend). Geek chic is alive and well, baby.



MICROSOFT'S CULTURAL UNDERSTANDING OF KIWIS

Microsoft is offering New Zealanders a customised version of XP Home's Bliss wallpaper backgrounds. It features... sheep. Just in case they don't have enough sheep to look at. But if you're a Kiwi who's not into sheep, Microsoft has a special "Queen's Birthday Edition — Kiwi Style" wallpaper as well, featuring the Queen's corgis. Download them from www.microsoft.com/nz/windowsxp/downloads/bliss/nzbliss_download.aspx.

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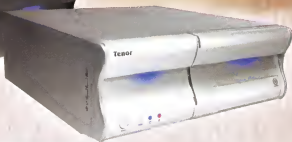
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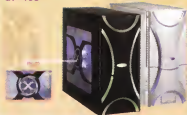
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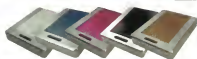
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CB0002

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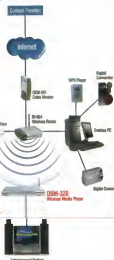


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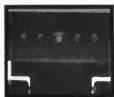
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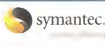


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Please call our Managed Accounts team on 1300 761 761 for queries on Vodafone products and prices.



BLACKBERRY 7100v1

Send and receive emails, access the internet and your office network, while doing business on the move.

- :: Emails sent to the palm of your hand
- :: Works as a mobile and PDA
- :: Unique user-friendly menu
- :: Lightweight and pocket sized
- :: \$1 per day for up to 500 emails/ 1MB per month on Mobile Email 30**

**On Mobile Email 30 if you go over your limit of 500 emails (or 1MB of data) in a month, you will be upgraded to the Mobile Email 50 Bundle and will be charged an additional \$25 for the rest of the month.

\$711
Save \$88
WebCode: VOD7102



VODAFONE MOBILE CONNECT

Vodafone Mobile Connect is the quick, secure way to access email and internet via your laptop, via the Vodafone GPRS network.

- :: Access your office on the move
- :: Takes as little as 5 minutes to set up
- :: Fast, secure connection
- :: No cords, no cables, no plugs
- :: Get unlimited internet access for just \$49.95 per month***

***For credit approved applicants. Fair use policy applies and may affect usage over 500MB a month.

Outright
\$231
Save \$68
WebCode: VOD721

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Century CD/DVD 100 Disk Storage

The safe and convenient way to store and retrieve your important data and entertainment. Provides 100 disc capacity per CCD unit.

Price to clear!



Our Price \$69 **Save \$30**
WebCode: GD50001

Kensington Security Notebook Combosaver

- No keys to lose - one piece design is easy to use.
- Attaches to the built-in Kensington security slot found on 95% of all notebook computers.
- Strong, six-foot cable is an effective physical and visual deterrent to theft.
- Cable securely anchors computer to any immovable object.



Our Price \$60 **Save \$42**
WebCode: KEND030

Imation Disc Stakka

The Imation Disc Stakka is an automated carousel that gives you a simple and efficient way to manage and protect your disc library. Each unit stores and protects up to 100 data CDs, DVDs, music or game discs and links to your computer via a USB connection. The bundled OptiTracker software enables you to search its database of stored discs by title, keyword, directory or file name to find and eject any disc within seconds.



Our Price \$171 **Save \$28**
WebCode: MMM1214

HP ProLiant ML350 G4 Server + Microsoft Small Business Standard Bundle

Outstanding performance, affordable price

Value is a hallmark of ProLiant servers, and the ProLiant ML350 server is no exception. It combines the latest Intel processors with high performance I/O and memory technology at a price that fits smaller budgets.

Simplified management, from setup to updates

The ProLiant ML350 server is designed for simplified access and easy management. HP ProLiant Essentials software, including SmartStart, is shipped with your server, so you can be up and running quickly. For ongoing management, HP Systems Insight Manager monitors and alerts on server status, so staff can focus on priority projects. And with the Lights Out technology of HP Remote Insight Lights-Out Edition II (iLO II), you can view the server console and install updates anytime, anywhere—even when the doors are down.

Windows Small Business Server 2003 Standard Edition

Includes Windows Server 2003 and Exchange Server 2003 technology. Get the capabilities of a security-enhanced small-business network with storage, printing, collaboration, e-mail, Internet connectivity, support for mobile workers, and faxing.

Series:	ProLiant ML350
Manufacturer #:	356003-011
Processor:	Xeon 3.2GHz Upgradable to 2 Processors
Memory (Ram):	512MB PC2700 DDR
Cache memory:	Integrated 1MB Level 2 cache
Hard Drive:	2 x 72GB 10000 RPM SCSI
HDD Controller:	Dual Channel Ultra320 SCSI Adapter
Optical Storage:	48X IDE CD-ROM Drive
Ethernet:	NC7761 PCI Gigabit NIC
Ports:	1 x Parallel, 1 x Serial, 1 x Pointing Device, 1 x VGA, 1 x Kbd, 1 x RJ-45, 3 x USB Ports
Slot Totals:	1 x 133MHz PCI-X, 2 x 100MHz PCI-X, 1 x 66MHz PCI-X, 1 x PCI-E X8, 1 x PCI-E X4
Form Factor:	Tower or SU rack
Warranty:	3 Years Limited Warranty (3 Years Parts, 3 Years Labour & 3 Years On-Site); Global Warranty

Our Price \$4892 **Save \$103**
WebCode: COB4223



HP Desktops

Series:	DX6120 Slim Tower
Manufacturer #:	PV030PA
Processor:	Intel Celeron 2.66 GHz
Memory (Ram):	512MB PC3200 DDR2
Video Card:	Intel Graphics Media Accelerator 900
Hard Drive:	80GB 7200rpm
Optical Storage:	DVD Combo
Ethernet:	Integrated Broadcom NetXtreme Gigabit
Operating System:	Microsoft Windows XP Professional
Keyboard:	2004 Standard Keyboard
Mouse:	2-Button Scroll Mouse
Warranty:	3yr parts, 1yr labour, 1yr onsite

Our Price \$899 **Save \$50**
WebCode: COD1041

Series:	DX6120 Microtower
Manufacturer #:	PV026PA
Processor:	Intel Celeron 2.66 GHz
Memory (Ram):	512MB PC3200 DDR2
Video Card:	Intel Graphics Media Accelerator 900
Hard Drive:	160GB 7200rpm
Optical Storage:	CDRW
Ethernet:	Integrated Broadcom NetXtreme Gigabit
Operating System:	Microsoft Windows XP Professional
Keyboard:	2004 Standard Keyboard
Mouse:	2-Button Scroll Mouse
Warranty:	3yr parts, 1yr labour, 1yr onsite

Our Price \$899 **Save \$50**
WebCode: COD1037

HP DX 6100 MT model displayed



HP DX 2000 MT model displayed



Series:	DX6120 Slim Tower
Manufacturer #:	PV031PA
Processor:	Intel Pentium 4 Processor S20 2.8GHz
Memory (Ram):	512MB PC3200 DDR2
Video Card:	Intel Graphics Media Accelerator 900
Hard Drive:	80GB 7200rpm
Optical Storage:	DVD Combo
Ethernet:	Integrated Broadcom NetXtreme Gigabit
Operating System:	Microsoft Windows XP Home
Keyboard:	2004 Standard Keyboard
Mouse:	2-Button Scroll Mouse
Warranty:	3yr parts, 1yr labour, 1yr onsite

Our Price \$1099 **Save \$50**
WebCode: COD1042

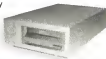
Series:	DX6120 Microtower
Manufacturer #:	PV027PA
Processor:	Intel Pentium 4 Processor S20 2.8GHz
Memory (Ram):	512MB PC3200 DDR2
Video Card:	Intel Graphics Media Accelerator 900
Hard Drive:	80GB 7200rpm
Optical Storage:	DVD Combo
Ethernet:	Integrated Broadcom NetXtreme Gigabit
Operating System:	Microsoft Windows XP Professional
Keyboard:	2004 Standard Keyboard
Mouse:	2-Button Scroll Mouse
Warranty:	3yr parts, 1yr labour, 1yr onsite

Our Price \$1195 **Save \$50**
WebCode: COD1038

Certance DDS-5 External Tape Drive

Certance's DDS5 technology provides reliable and affordable tape data protection for the small and medium businesses.

- Up to 72GB Capacity on a single cartridge
- Includes Yosemite TapeWare XE Backup Software (Windows, Linux & Netware)
- Up to 25 Gb/hr
- 3 Year Warranty



Our Price \$1321 Save \$78
WebCode CER0006

Certance LTO 2 External Tape Drive

Certance's LTO 2 tape drives balance price with capacity/performance a perfect match for the medium-to-large businesses.

- Capacity up to 400GB per cartridge
- Enterprise class performance up to 245Gb/hr
- Full backward compatibility with LTO1 tape drives from all manufacturers



Our Price \$4520 Save \$417
WebCode CER0020

Certance LTO 3 External Tape Drive

Certance's LTO 3 solution provides the largest capacity of any LTO technology to date, at the lowest price points.

- Up to 800GB capacity on a single cartridge
- Up to 490Gb/hr
- Backward compatible with LTO 2 and LTO 1 media
- 3 Years Warranty



Our Price \$8020 Save \$201
WebCode CER0062

Snap Appliance 2200

Add a whisper-silent file server with RAID for a fraction of the cost of a traditional file server.

- 500GB, Simple, award-winning user interface for ease of management
- RAID 1 (mirroring), 0 (striping) or JBOD (Just a Bunch Of Disks)
- 100Base-TX/10Base-T Ethernet connectivity



Our Price \$2450 Save \$410
WebCode SNA0030

Snap Appliance 4200

High-end features and an attractive price point drive down the cost of workgroup storage in your enterprise. No other storage server offers so much for so little.

- 2.0 GHz Intel processor
- Up to 3GB of Double Data Rate (DDR) memory
- Dual Gigabit Ethernet ports
- Integrated Computer Associates eTrust antivirus software
- Backup agent support for CA, VERITAS and Legato



Our Price \$5153 Save \$302
WebCode SNA1000

Snap Appliance 4500

Industry-leading performance and capacity for departmental storage for your enterprise. No other 1U storage server matches its performance, capacity and feature set.

- Ideal for: File sharing, near-line storage, on-line backup, remote office server
- Every Snap Server 4500 can support up to two Snap Disk 10 expansion arrays for easy to manage, best-in-class storage expansion
- 1 Terabyte storage



Our Price \$9588 Save \$412
WebCode SNA0090

Tandberg SDLT320 External Drive Kit

The SDLT320 presents a major advance in capacity and performance over the very popular DLT8000.

- 320GB* of Compressed Capacity
- Kit includes: 1 SDLT Media, SCSI Cable & Terminator and Power Cord
- 3 Years Advanced Replacement Warranty*



Our Price \$4275 Save \$170
WebCode TAN0020

Tandberg 420 LTO 2 Internal Drive

The world's most compact LTO2 drive with unrivalled performance. NEW Half Height Internal LTO2 bare drive. LTO2 capacity at LTO1 prices!

- Up to 400GB* Capacity
- Space saving half height design
- Up to 173GB/hr performance
- 3 Years Advanced Replacement Warranty



Our Price \$2928 Save \$48
WebCode TAN0003

Tandberg 420 LTO 2 External Kit

NEW Half Height External LTO2 drive kit. Industry leading performance at an affordable price.

- Up to 400GB* Capacity
- Revolutionary half height design
- Includes SCSI Cable and Terminator
- 3 Years Advanced Replacement Warranty



Our Price \$3278 Save \$53
WebCode TAN0004

Tandberg M1500 LTO 2 StorageLoader

NEW StorageLoader LTO2 Half Height offers capacity and performance as well as advanced data management features in a compact low profile 1U form factor.

- 8 Slots, up to 3.2TB* capacity
- 1U Form factor
- Includes: Rack mount kit, SCSI Cable & Terminator and Power Cord
- 3 Years Advanced Replacement Warranty*



Our Price \$6988 Save \$1462
WebCode TAN0005

Tandberg M1500 LTO 2 Tape Library

Modular & Stackable Data Protection. Enterprise class automated tape library with expandability and upgradeability.

- 25 Slots Capacity (up to 10TB*)
- Single or Dual Drive Configuration
- LVD SCSI Connection (optional FC)
- Barcode Reader
- 3 Years Advanced Replacement Warranty*



Our Price \$14,500 Save \$500
WebCode TAN0006

Tandberg Viking FS-400 NAS

NEW 1TB NAS appliance, perfection addition for department storage and enterprise. Ideal for file sharing, near-line storage, disk to disk backup and remote office server.

- Microsoft OS
- 4HD0 with 1TB Capacity
- Rack mount kit
- RAID 1 and 5
- 3 Years Advanced Replacement Warranty*



Our Price \$6242 Save \$103
WebCode TAN0007

MGE NOVA 600VA UPS

Most cost effective Line Interactive UPS available on the market today. A perfect mate for protection of personal and professional PC.

- Automatic Voltage Correction
- Wide Tolerance to fluctuations (160V to 290V)
- Telephone/Fax/Modem Line Filtering
- USB Comm Port & Management s/w
- 2 Years Warranty



Our Price \$112 Save \$8
WebCode MGE0031

MGE Evolution 1500VA Rack UPS

High Density, True Sinewave Power Protection for server, storage and networking equipment.

- 1U Design, Rack Mount included
- USB & Serial Communication
- Automatic Voltage Regulation
- Management S/W for PC and MAC
- 2 Years Warranty



Our Price \$1040 Save \$139
WebCode MGE0053

SonicWALL TZ150 Firewall/Switch

Low cost, easy-to-use layered protection for small/medium businesses.

- Secure remote VPN Access
- Deep Packet Inspection
- (S) 10/100 Ethernet (WAN, 4 port LAN Switch)
- Supports up to 10 nodes
- Supports DES, 3DES, AES



Our Price \$506 Save \$186
WebCode SWL0103

Viewmaster Duad Servers



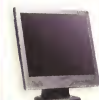
Duad S450P model displayed

Call 1300 761 761
for queries on
available server
options and
pricing!

Viewmaster 17" Silver/Black LCD Monitor with Speakers

MLV5575BK
(Available in Beige)

- View Angle (H)+75° (V)+75°-60° (CR)=10°
- Contrast Ratio 450:1
- Brightness 260cd/m2
- Response Time 16ms
- Resolution 1280 x 1024



Our Price \$355 **Save \$74**
WebCode: HAL0020

Viewmaster 19" Silver/Black LCD Monitor

MLV9985BK
(Available in Beige)

- View Angle (H)+ 85° (V)+ 85° (CR)=10°
- Contrast Ratio 500:1
- Brightness 250cd/m2
- Response Time 25ms
- Resolution 1280x 1024



Our Price \$517 **Save \$54**
WebCode: HAL0021

Viewmaster Advantage BTX EVO System

The all new whisper quiet system

Silver & Black BTX minitower with front USB2.0/Audio/Firewire

- Series: Mini Tower
Processor: Intel Pentium 4 3.0GHz
Memory (Ram): 256MB, PC-3200 DDR 400MHz
Video Card: Integrated
Hard Drive: 80G
Optical Storage: DVD Writer, 1.44 Floppy
Ethernet: 10/100/1000
Operating System: Microsoft Windows XP Pro
Keyboard/Mouse: Viewmaster Multimedia PS2
Card Reader: 11 in 1 card reader
Warranty: 3 year Onsite Warranty

Our Price \$1255 **Save \$144**
WebCode: QME0005

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your PC!



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Image used for
illustration purposes only.
Monitor not included.

Series:	SQHO - Mid Tower	Business - Slim Line	Performance - Mid Tower
Processor:	AMD Athlon™ 64 Processor 3000+	AMD Athlon™ 64 Processor 3000+	AMD Athlon™ 64 Processor 3000+
Memory (Ram):	512MB PC-3200 DDR 400MHz	512MB PC-3200 DDR 400MHz	512MB PC-3200 DDR 400MHz
Video Card:	Integrated	Integrated	Geforce 6200 128 DVI TV-out
Hard Drive:	80GB 7200RPM SATA	80GB 7200RPM SATA	80GB 7200RPM SATA
Optical Storage:	16X DVD Combo, 1.44MB Floppy	16X DVD Combo, 1.44MB Floppy	16X DVD Writer, 1.44MB Floppy
Ethernet:	10/100MB LAN	10/100MB LAN	10/100/1000MB LAN
Operating System:	MS Windows XP Home	MS Windows XP Professional	MS Windows XP Professional
Keyboard/Mouse:	Viewmaster Multimedia PS2	Viewmaster Multimedia PS2	Viewmaster Multimedia PS2
Card Reader:	11 in 1 card reader	Optional	11 in 1 card reader
Warranty:	3 year Onsite Warranty	3 year Onsite Warranty	3 year Onsite Warranty



Our Price \$999 **Save \$96**
WebCode: HAL0029



Our Price \$1075 **Save \$124**
WebCode: HAL0030

Our Price \$1420 **Save \$79**
WebCode: HAL0031

Viewmaster Portiva S7z1v

- Processor: Intel® Pentium® M Processor 730 1.6GHz
Memory (Ram): 512MB Dual Channel PC-4200 DDR2-533
Graphics Card: nVIDIA GeForce Go 6600 GPU
Wireless LAN: Intel® Pro Wireless 2200BG
Hard Drive: 40GB
Optical Storage: DVD Dual Writer
Display: 15.4" TFT LCD widescreen WXGA 1280x800
Modem/Ethernet: 56K V.92 Modem, 10/100/1000Mb LAN
Pointing Device: Touchpad
Interface: 5 x USB 2.0, 1 x Firewire IEEE 1394b
Operating System: Microsoft Windows XP Home
Warranty: 3 Year on site warranty

Our Price \$2300 **Save \$195**
WebCode: HAL0032



PRICE MAY DROP!
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Viewmaster

BY HALLMARK



Series:	Portiva S223	Portiva SP53	Portiva S510
Processor:	Intel® Pentium® M Processor 725 1.6GHz	Intel Celeron M 1.3GHz Processor	Intel® Pentium® M Processor 725 1.6GHz
Memory (Ram):	512MB PC-2700 DDR333	256MB PC2700 DDR RAM	512MB PC-2700 DDR333
Graphics Card:	Intel® Extreme Graphics	VIA Shared Memory Video	Intel® Extreme Graphics
Wireless LAN:	Intel® Pro Wireless 2200BG	802.11G Wireless	Intel® Pro Wireless 2200BG
Hard Drive:	40GB	30GB	40GB
Optical Storage:	DVD Dual Writer	CRDWDV Combo Drive	DVD Dual Writer
Display:	12.1" TFT LCD widescreen WXGA 1280x800	15" XGA TFT LCD - 1024x768	15" TFT LCD XGA 1024x768
Modem/Ethernet:	56K V.92 Modem, 10/100Mb LAN	56K V.92 10/100 LAN	56K V.92 Modem, 10/100Mb LAN
Pointing Device:	Touchpad	Intelligence Glide Pad with 2 buttons	Touchpad
Interface:	2 x USB 2.0, 1 x Firewire IEEE 1394a	4 x USB 2.0, VGA, S-Video, PCMCIA, Line Out	3 x USB 2.0, 1 x Firewire IEEE 1394a
Operating System:	Microsoft Windows XP Home	Microsoft Windows XP Home	Microsoft Windows XP Home
Warranty:	3 Year on site warranty	3 year onsite warranty (upgrade options available)	3 Year on site warranty

Our Price \$1455 **Save \$244**
WebCode: VIE0021

Our Price \$1975 **Save \$224**
WebCode: OME0006

Our Price \$2095 **Save \$204**
WebCode: VIE0020

HP Notebooks

Series: NX6120
 Manufacturer #: PV131PA
 Processor: Intel Celeron M Processor 360 1.4GHz
 Memory (Ram): 256MB 333MHz DDR
 Video Card: Intel® Graphics Media Accelerator 900
 Hard Drive: 40GB 5400rpm
 Optical Storage: DVD/CD-RW Combo
 Display: 15" TFT XGA
 Modem/Ethernet: High speed 56K modem, 10/100/1000 NIC
 Pointing Device: Touchpad With Scroll Zone
 Operating System: Microsoft Windows XP Professional
 Weight: 2.75kg
 Warranty: 1 Year

Our Price \$1365 Save \$30

WebCode: HCN0008

HP NC6220 notebook displayed



PRICE MAY DROP!
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HP nx6120 notebook displayed



Series: NX6120
 Manufacturer #: PV131PA
 Processor: Intel Pentium M Processor 730 1.6GHz
 Memory (Ram): 512MB 333MHz DDR
 Video Card: Intel® Graphics Media Accelerator 900
 Hard Drive: 60GB 5400rpm
 Optical Storage: DVD±RW/±R
 Display: 14.1" TFT XGA
 Modem/Ethernet: 56K modem, 10/100/1000 NIC, BT, Wifi
 Pointing Device: Touchpad With Scroll Zone
 Operating System: Microsoft Windows XP Professional
 Warranty: 1 Year

Our Price \$2052 Save \$43

WebCode: HCN0011

NC6000
 PQ148PA
 Intel® Pentium® M Processor 1.6GHz
 256MB 333MHz DDR
 ATI Mobility Radeon 9600 Pro
 40GB 5400rpm
 BX DVD-ROM
 15" TFT XGA
 High speed 56K modem, 10/100/1000 NIC
 Touchpad and Pointing Stick
 Microsoft Windows XP Professional
 3 Years

Our Price \$2406 Save \$105

WebCode: CON1505

NC6220
 PV139PA
 Intel Pentium M Processor 740 1.73GHz
 512MB 400MHz DDR
 Intel® Graphics Media Accelerator 900
 40GB 5400rpm
 DVD/CD-RW Combo
 14.1" TFT XGA
 56K modem, 10/100/1000 NIC, BT, Wifi
 Touchpad With Scroll Zone
 Microsoft Windows XP Professional
 3 Years

Our Price \$2691 Save \$104

WebCode: HCN0007

IBM Notebooks

Series: R50e
 Manufacturer #: 1834KM7
 Processor: Intel Celeron Mobile 1.4GHz
 Memory (Ram): 256MB 266MHz DDR
 Video Card: 64MB Intel 855GM
 Hard Drive: 30GB ATA-100
 Optical Storage: DVD/CD-RW Combo
 Display: 14.1 Backlit TFT
 Modem/Ethernet: 56K Modem, 10/100
 Pointing Device: Trackpoint
 Operating System: Microsoft Windows XP Pro
 Weight: 2.9kg
 Warranty: 1 year

Our Price \$1263 Save \$36

WebCode: IBT4851

IBM R51 model displayed



IBM X40 model displayed

Series: R51
 Manufacturer #: 2887GV1M
 Processor: Intel Pentium M 725 1.60GHz
 Memory (Ram): 512MB 333MHz DDR
 Video Card: Intel Extreme Graphics 2
 Hard Drive: 60GB ATA-100
 Optical Storage: DVD/CD-RW Combo
 Display: 15.1 Backlit TFT
 Modem/Ethernet: 56K Modem, 10/100, Wifi
 Pointing Device: ThinkPad UltraNav
 Operating System: Microsoft Windows XP Pro
 Warranty: 1 year

Our Price \$1732 Save \$247

WebCode: IBT4796

G41
 28818PM
 Mobile Intel Prescott 3.33GHz
 256MB 333MHz DDR
 NVIDIA GeForce FX Go5200
 40GB ATA-100
 DVD/CD-RW Combo
 15.1 Backlit TFT
 56K Modem, 10/100, Wifi
 Trackpoint
 Microsoft Windows XP Pro
 1 year

Our Price \$2304 Save \$295

WebCode: IBT4796

T43
 266884M
 Intel Pentium M 750 1.86GHz
 512MB 533MHz DDR
 ATI Mobility RADEON x300
 40GB ATA-100
 CD-RW/DVD-ROM Combo
 15" Backlit TFT
 56K Modem, 10/100/1000, Wifi
 ThinkPad UltraNav
 Microsoft Windows XP Pro
 1 year

Our Price \$3451 Save \$98

WebCode: IBT4200

Toshiba Tecra A3 Notebook

- Tecra A3 (PTA304-01U002)
- Intel Pentium M 740 Processor 1.7GHz
- 512MB DDR2 PC700 Memory
- Intel® Graphics Media Accelerator 900
- 60GB 5400rpm Hard Drive
- DVD SuperMulti Optical Storage
- 15" TFT XGA Display
- V52 modem, 10/100 TX-LAN
- 802.11abg WiFi



image used for illustration purposes only.

Our Price \$2288 Save \$77

WebCode: TOS2557

Toshiba Portege M300 Notebook

- Portege M300 (PPM300A-02ED01)
- Mobile Intel® Pentium® M Processor 733 1.2GHz, 256MB+256MB, 12.1" XGA, 60GB
- DVD SuperMulti (DVD±RW/DVD-RAM), SD media slot, modem, LAN, Integrated Intel mini PCI card (802.11b/g)
- Integrated Bluetooth V1.2
- Integrated Touchpad, (Optional)



image used for illustration purposes only.

Our Price \$3529 Save \$101

WebCode: TOS4022

Toshiba Portege M200 Tablet

- Portege M200 (PPM21A-02899)
- Intel® Pentium® M Processor 725
- 1.6GHz 2MB L2 Cache 400MHz FSB, 512MB
- 12.1" TFT SXGA+
- 80GB, modem, LAN
- Integrated Intel wireless LAN mini-PCI card (802.11b/g)
- Integrated Bluetooth, (Optional)
- Integrated FDDI, Touchpad, 2 x USB (2.0)
- MS OneNote



image used for illustration purposes only.

Our Price \$3830 Save \$130

WebCode: TOS3506

RENT SMART
 Because buying isn't

SEE PAGE 3 FOR DETAILS

TFT Screen Clean

For use on all coated and non-coated Laptop, Notebook, TFT, Plasma, LCD, PDA, GPS, Mobile, basically any Screen or Monitor. Extensively tested by Users and Manufacturers, Laboratory and Industry test have shown that CLEANSAFE will clean and protect all screen surfaces.



Our Price \$18 **Save \$4**
WebCode: CLE0001

Palmone Treo 650 Stylus Pack

Replacement Treo 650 smartphone stylus are always a handy thing to have just in case you lose or snap one. Sold in pack of three.



Our Price \$16 **Save \$6**
WebCode: USR0503

Palmone LifeDrive Hard Case

A sturdy, stylish case surrounds a LifeDrive mobile manager.

Convenient access to buttons and connectors allows user to use device even while it's inside the case.

The brushed aluminum cover contrasted by the black, slip-resistant rubberized back makes it a unique and safe way to carry a LifeDrive mobile manager.



Our Price \$52 **Save \$12**
WebCode: USR0208

Samsung Black 17" LCD Monitor 710V

Syncmaster 710V has a slim and stylish design. With a stunning picture resolution, it provides marvelous performance that is flexible for your working preference.

- 17" Viewable Area
- 290 cd/m² Brightness
- 500:1 Contrast Ratio
- 150/120 Viewing Angle (H/V)
- 25 ms Response Time
- Analog Interface
- 1280x1024 Max. Resolution



Our Price \$354 **Save \$145**
WebCode: SAM1742

Philips 17" Business Silver SXGA LCD monitor

- Resolution: 1280 x 1024
- Brightness: 250 nits
- Contrast Ratio: 500:1
- Response time: 8 ms
- Size inc base: 375W x 377H x 210D
- Weight: 4.8kg

High performance for demanding users



Our Price \$408 **Save \$306**
WebCode: PHP1630

O2 XDAll Mini

- MS Win Mobile 2003 PocketPC Phone Edition
- Intel PXA 272 CPU, Clock speed: 416MHz
- Bluetooth 1.2 compliant
- 2.8" Transflective TFT LCD Screen
- 1.3 mega-pixel VGA camera
- Standby 180 hours, Talk time 4 - 5 hours
- 4 programmable buttons: Camera, Voice Recorder, Contact and Calendar
- Colour CMOS 1.3 mega-pixel camera



Our Price \$930 **Save \$269**
WebCode: XDA0300

O2 XDA III Pocket PC & GSM Phone

One of the most powerful Windows Mobile based PDAs available, it's an enhanced version of the popular Xda II and is a personal organiser and a GPRS mobile all-in-one. With tri-band coverage for roaming to the USA, a 1.3 megapixel camera for taking high quality pictures, Bluetooth for use with your Bluetooth devices, Xda III is a flexible and sleek device. Use the integrated Wireless LAN for high-speed internet access.



Our Price \$1456 **Save \$143**
WebCode: XDA0400

Samsung Black 19" LCD Monitor 910T

Syncmaster 910T has an amazing colour calibration system that gives you perfect performance everytime.

- 19" Viewable Area
- 250 cd/m² Brightness
- 800:1 Contrast Ratio
- 170/170 Viewing Angle(H/V)
- 25 ms Response Time
- Analog/Digital Interface
- 1280x1024 Max. Resolution



Our Price \$569 **Save \$530**
WebCode: SAM1917

Philips 19" Business Black SXGA LCD Monitor

- Resolution: 1280 x 1024
- Brightness: 250 nits
- Contrast Ratio: 600:1
- Response Time: 8 ms
- Size inc base: 425W x 410H x 235D
- Weight: 6.4kg

Big display for demanding users



Our Price \$603 **Save \$386**
WebCode: PHP1909

HP iPAQ Pocket PC RZ1710

With the HP iPAQ PC RZ1710, you can increase your storage capacity with SD and MMC memory cards so you can bring essential documents anywhere you go. Transfer documents, multimedia files, and special programs onto memory cards and print using any SD enabled printer.



Our Price \$379 **Save \$20**
WebCode: CQO0117

HP iPAQ Pocket PC RZ3417

Tune in to your favourite music and view holiday photos stored on your desktop PC by simply streaming it to your iPAQ. With Media Control, you can get the freedom to play your music, videos and photos on your preferred players. From your desktop PC to your TV and home stereo systems.



Our Price \$580 **Save \$19**
WebCode: CQO0119

Samsung 17" LCD Monitor/Television 730MW

Delivering a 500:1 contrast ratio, 0.289mm pixel pitch, 1280 x 768 maximum resolution, scanning frequency of 30-61 kHz horizontal and 56-75 Hz vertical, and horizontal/vertical viewing angle of 150°/120°. The SyncMaster 730MW has a built-in TV tuner (with FM Radio support), is HDTV ready and has dual analog/digital inputs.



Our Price \$774 **Save \$125**
WebCode: SAM1747

Philips 20" Widescreen Silver WSXGA LCD Monitor

- Resolution: 1680 x 1050
- Brightness: 300 nits
- Contrast Ratio: 600:1
- Response time: 16 ms
- Size inc base: 478W x 423 H x 235D
- Weight: 7.6kg

Your best choice for big, widescreen productivity



Our Price \$1095 **Save \$554**
WebCode: PHP1615

Palmone Tungsten T5

- 256MB flash memory
- Transfer files and folders back and forth to your desktop
- Stunning 320 x 480 display, landscape or portrait mode
- Edit Word and Excel docs, view PowerPoint files
- View photos, videos and play MP3s
- Built-in Bluetooth wireless technology
- Powerful Intel 416MHz XScale processor
- Palm OS 5.4



Our Price \$540 **Save \$59**
WebCode: USR1035

Palmone Lifedrive

- 4GB hard drive (3.85GB user accessible)
- LifeDriveTM smart file management
- Wi-Fi (802.11b) and Bluetooth v1.1
- 320 x 480 hi-resolution, colour display
- Supports native Word, Excel, and PowerPoint files
- Portrait and landscape viewing
- Supports secure wireless email access with attachments
- Built-in Microsoft Exchange ActiveSync
- MP3 player
- Intel 416MHz XScaleTM processor



Our Price \$727 **Save \$172**
WebCode: USR0203

Panasonic Lumix DMC-LZ1 Digital Camera

- 4 Megapixel Effective Camera
- 6x Optical Zoom in a compact body
- MEGA Optical Image Stabiliser
- 2.0" TRM LCD Monitor
- Venus Engine Plus LSI

NEW



Winner of the PC User Magazine "TOP BUY" Award
• June 2005

Our Price **\$455** Save **\$44**
WebCode... PAN0024

Sony 4.1MP Cyber-shot DSCS40 Digital Camera

So small, yet so powerful - the Cyber-shot DSCS40 digital camera from Sony provides you with big features at an amazingly small price. With its high quality 1/2.7" Super HAD CCD, 3X optical zoom Carl Zeiss lens, and ultra-fast Real Imaging Processor it captures consistently beautiful 4.1 Megapixel images everytime.



Our Price **\$262** Save **\$37**
WebCode... SNY0333

Canon IXUS 40 Digital Camera

The 4.0 Megapixel Digital IXUS 40 delivers an unparalleled combination of cutting edge technology and ultra compact style. Featuring Canon's revolutionary UA lens technology, the fully retractable 3x optical zoom lens delivers sharp, high resolution images. The new DIGIC II image processor provides fast performance and industry leading image quality. 60fps movie recording and playback with sound



Our Price **\$499** Save **\$130**
WebCode... CAN0337

Secure Digital Cards

- Sandisk Secure Digital Card
- 128MB (SMD201) \$28
 - 256MB (SMD202) \$45
 - 512MB (SMD387) \$71
 - 1GB (SMD388) \$136

- Sandisk Secure Digital Ultra
- 512MB (SMD711) \$71
 - 1GB (SMD987) \$162



Compact Flash Cards

- Sandisk
- 128MB (SMD188) \$24
 - 256MB (SMD189) \$41
 - 512MB (SMD190) \$70
 - 1GB (SMD191) \$130
 - 2GB (SMD690) \$258
- Sandisk Ultra II
- 256MB (SMD193) \$47
 - 512MB (SMD194) \$84
 - 1GB (SMD1002) \$155
 - 2GB (SMD691) \$292



Panasonic Lumix DMC-FZ20 Digital Camera

- 5.0 Megapixel
- 12x Optical Zoom, 4x Digital
- Leica DC Vario-Elmarit Lens
- MEGA Optical Image Stabiliser (O.I.S.)
- Manual Focus Ring

NEW



Also Available in Silver
WebCode PAN0025

Recommended by PC World in its December Issue as its pick for best value intermediate camera.

Our Price **\$945** Save **\$154**
WebCode... PAN0025

Sony 5.1MP Cyber-shot DSCW55 Digital Camera

A classic design meets modern technology in the Cyber-shot WS digital camera from Sony. It combines a traditional rangefinder camera layout with high-end features such as a huge 2.5" LCD screen, 1.5 Megapixel image capture, and high speed performance thanks to the Real Imaging Processor chip.



Our Price **\$529** Save **\$70**
WebCode... SNY0330

Canon 5MP Powershot S2IS Digital Camera

- Rock steady ultra-zoom. High resolution photos & movies.
- 5.0 Megapixel.
- Canon 12x optical zoom lens with Optical Image Stabiliser.
- Super Fast DIGIC II Imaging Processor.
- Print/Share* Button for "one push" printing and downloading of images straight from the camera.



Our Price **\$679** Save **\$120**
WebCode... CAN0393

Kodak Easy Share C360 Digital Camera

- The smart C360—designed for all that captivates you.
- 5.0 MP for prints up to 20 x 30 in. (50 x 75 cm)
- 3K optical zoom
- 17 easy-to-access scene modes and 5 color modes
- On-camera picture-enhancing features
- KODAK Color Science Chip

NEW



Our Price **\$432** Save **\$17**
WebCode... KOD0360

Olympus 5.0MP MJU-500 Digital Camera

- Retracting lens barrier
- 3x Optical Zoom
- Large 2.5" Hyper Crystal LCD
- 20 Scene programs
- Super macro mode from as close as 7cm
- Movie recording function with sound
- PicBridge support and TruePic TURBO
- Supplied with 32MB XD-Picture card



Our Price **\$539** Save **\$60**
WebCode... OLY0049

Canon MV800i Digital Video Camera

- Super powerful 20x zoom lens
- High resolution 800k pixel CCD and DIGIC DV
- Stylish and compact, designed for simple operation
- Real Widescreen recording for breathtaking playback on widescreen TVs
- Image Stabilizer function
- Night Mode



Our Price **\$682** Save **\$47**
WebCode... CAN0366

xD Picture Cards

- Olympus
- 128MB (OLY0013) \$39
 - 256MB (OLY0010) \$70
 - 512MB (OLY0018) \$125
- Sandisk
- 64MB (SMD383) \$26
 - 128MB (SMD384) \$49
 - 256MB (SMD385) \$77
 - 512MB (SMD382) \$121



Kodak Easy Share Digital Camera 5.3MP 2740 + Bundled Printer Dock

Capture extraordinary detail with the 2740 Zoom Digital Camera. 10X optical zoom, 5.0 MP, everything you need to get the shot you want. Then simply dock your camera and touch a button to print real KODAK Pictures that last a lifetime.

NEW



Our Price **\$703** Save **\$46**
WebCode... KOD0741

Olympus 4.0MP MJU-Mini Digital Camera (Silver)

- 4-megapixel effective CCD for images up to 2272 x 1704 pixels
- Program (Auto), Movie, and 16 Scene program modes
- Shutter speeds from 1/1000 to 1/2 second
- Built-in all-weather speaker and microphone
- Lithium rechargeable battery and charger included



Our Price **\$374** Save **\$25**
WebCode... OLY0046

Sony DVD201 DVD Handycam

- DVD-RW/R
- Carl Zeiss Lens
- 120x/20x Selectable Digital zoom
- 2.5" LCD Hybrid Screen
- Advance HAD Technology
- Start/Stop Button on LCD Frame
- Video i/Vr mode
- Playlist Edit: Add, Delete, Move, Divide
- Photomovie Create
- Automatic White Balance



Our Price **\$1514** Save **\$235**
WebCode... SNY9799

Memory Stick

- Sony Memory Stick Pro
- 1GB (SNY0211) \$282
- Sandisk Memory Stick Pro
- 256MB (SMD0707) \$63
 - 512MB (SMD0707) \$99
 - 1GB (SMD0209) \$187
 - 2GB (SMD390) \$385
- Sandisk Memory Stick Pro Ultra
- 256MB (SMD704) \$65
 - 512MB (SMD705) \$110
 - 1GB (SMD703) \$207



RENT SMART
Because buying isn't

SEE PAGE 3 FOR DETAILS

Dymo LabelWriter LW310 USB

The most affordable label printer currently on the market. Suitable for dozens of business, home & office applications such as envelopes, stock, file folders and shelf labels. Direct thermal technology eliminates toner, ink and ribbon costs. Print width 40mm



Our Price **\$143** Save **\$6**

WebCode: DYM0002

Dymo LabelWriter 320

The most versatile label printer for any office. Prints labels up to 56 mm wide for envelopes, packages, file folders, disks, videotapes, name badges and much more. Improved with twice the print quality and 30% faster print speed. Use on USB port. Windows or Mac.



Our Price **\$286** Save **\$73**

WebCode: DYM0001

Dymo LabelWriter LW330 Turbo USB & Serial

The fastest label printer available with outstanding print quality and just 2 seconds per label. Direct thermal technology eliminates toner, ink and ribbon costs. Prints fonts, barcodes, graphics and photos. Print Width: 56mm



Our Price **\$319** Save **\$80**

WebCode: DYM0003

Wasp Barcode and Label Software Bundle

Wasp Barcode Labeler v5 (single user) with over 40,000 copies sold, Wasp Labeler is the top-selling barcode labeling software in the world! With Labeler v5's thoughtfully designed wizard interface, you can quickly create inventory, asset, address, barcodes & badge - practically any label for any industry. Ideal for Australian small business.

- Label wizard create labels step by step
- Data source wizard - Data linking from multiple tables
- Multiple number of label copies - Barcode image export
- Advanced serialization - Import data from virtually any database
- Import your favorite graphics - Serialize labels
- Print labels to any windows printer - Easy to use!

Label Software (WAS0001) **\$235**

Printer (ZEB0001) **\$2200**



Our Price **\$2285** Save **\$685**

WebCode: BUN0011

Wasp Mobile Asset Tracking Software Bundle

WASP MobileAsset Software offers the quickest and easiest way to track all your company assets including computers, printers, software, phones, tools, books, even personnel. Features: Add, Edit, Move, Dispose, Check-in/Out & Audit assets. Move by Location, Department, Purchase order or Custom filter. Check-in & Check-out assets to track who has the asset & when due back. Print Receipts on both the PC & Mobile printers. Schedule Maintenance to ensure assets are properly serviced. Attach any type of file to an asset - Pictures, Warranties, User Manuals. Import & Export Asset Data - Create your own asset barcode tags. Calculate Depreciation to determine the value of an asset. Easy, One-click synchronization between your PC and the handheld Data Collector. Secure Logon guards your asset information & tracks "who did what".

Symbol Palm OS Terminal SPT 1BXX Series. Palm OS platform, integrated miniature scan engine, Dragon Ball VZ - 33 MHz, Rugged housing meets IP54 Standards, 8 RAM and 4MB of ROM, High-contrast liquid crystal display with enhanced backlighting, 1-hour Ni-MH backup battery, 1.2 m drop to concrete, HDA port, Kit Inc Stylus, Slip Case, Lithium Ion Battery & Quick Reference Guide and Cradle

Mobile Asset Tracking Software (VAN0015) **\$836**

Symbol Palm (VAN0025) **\$1795**



Our Price **\$2499** Save **\$96**

WebCode: BUN0008

Wasp Affordable Employee Time & Attendance

WaspTime Time and Attendance offers computerised and automated time and tracking system with the proven technology of Barcode, Magstripe or RFID-based employee tags and time clocks.

This ready-to-use solution includes:

- Barcode, Magstripe or RFID time clock
- WaspTime - Time and Attendance software
- 25 employee Tags either Barcode, Magstripe or RFID (additional tags can be purchased)
- Includes license for 25 employees (additional licenses can be purchased in increments of 50)
- WaspStep Setup wizard to help with initial configuration
- 2 Ethernet cables (supports either direct to PC or via network)
- Power supply (an optional power-over-Ethernet is available)

Features:

- Proven technology of barcode system
- Automatically capture employee time (arrival time, break in/out, lunch, departure time)
- Automatically calculate hours worked and summarize for reports or payroll processing
- Capture and automatically process overtime
- Ability to capture sick days, vacation, conference time away • Supports, weekly, biweekly, bi-monthly, monthly payroll
- Over 12 reports including attendance report, timecard report, wage report, overtime report, payroll summary, absence report, roll call, employee list, early out report... plus create custom reports using Crystal Reports

Wasp POS Point of Sale Software for PC Cash Register

Wasp QuickStore is the easiest, quickest way to checkout customers and manage inventory. Simple and powerful, the point-of-sale and inventory control features are ideal for most retail stores environments. Your complete point-of-sale solution!



Our Price **\$710** Save **\$85**

WebCode: VAN0023

Wasp Fontware Software

WASP Barcode FontWare (Single User) Wasp FontWare is a powerful barcode utility that seamlessly integrates TrueType barcode fonts with your favorite business software and database applications. Wasp Bar Code fonts are compatible with all Windows applications including the most common word processors and spreadsheets. Easily create bar codes simply by using a font. Generating bar codes has never been easier!



Our Price **\$199** Save **\$76**

WebCode: VAN0021



Barcode Version
Our Price **\$852** Save **\$66**

WebCode: VAN0018

Magstripe Version
Our Price **\$1055** Save **\$85**

WebCode: VAN0019

RFID Tag Version
Our Price **\$1375** Save **\$110**

WebCode: VAN0020

Posiflex Hardware Bundle

You can turn a standard PC into a POS Computerised Cash Register when you buy a POSIFLEX hardware bundle. Simply "plug and play". Includes Posiflex PP5600D Dot-matrix printer, CR4100 Cash Drawer & CD2860 hand Scanner.



Posiflex CR-4100 CASH Drawers

Australia's most popular Cash Drawer which is receipt printer activated and designed to hold Australian currency with a tamper-proof designed casing and a removable cash tray for overnight security, it is security by design.

- Three position lock
- Cheque slot
- Supplied with 1 metre cable to connect to Posiflex, Epson, Star, Axiohm & current Citizen printers.
- Dimensions 428 (W) x 460 (D) x 100mm (H).



Epson TMT88 Thermal Receipt Printer

"Plug and play" high-speed Thermal Receipt Printer with clam shell "drop and load" design will work with most POS software applications.

- High-speed up to 150mm per sec
- Auto paper cutter
- Drop & load paper loading
- Prints a wide range of barcode symbologies
- Flash ROM for logo
- Includes Power Supply & Data Cable



Posiflex CD-2860 Barcode Scanner

The CD2860 contact touch barcode reader has a simple cable configuration. Plug into your PC and you can touch & read barcodes instantly.

- 80mm reading aperture
- 0-30mm scanning distance
- Auto discrimination
- Beeper & LED indicator
- Includes bench stand



Our Price \$627 **Save \$368**

WebCode POS0022

Our Price \$176 **Save \$49**

WebCode POS0008

Our Price \$605 **Save \$275**

WebCode EP30011

Our Price \$143 **Save \$102**

WebCode POS0020

Wasp Captra Mobile Sales Software Bundle

QuickBooks functionality right on your PDA - This product integrates with QuickBooks® Pro, Accountant, Enterprise and the variety of new Premier editions, Main Features:

- CaptraAdmin PDA management facility, Update Customer Records
- Prepare, Print and capture Signature on Estimates and Invoices
- Produce and Print Credit Memos, Receive Payments
- Manage Vendor Details, Issue and Print Purchase Orders
- Review Item Pricing, Count Inventory, Integrated Printer Subsystem
- Integrated Barcode Scanning, Cradle, Modem, LAN and Wireless LAN/WAN and internet sync, Remote
- Synchronization. Handheld works on most Palm OS devices

Symbol Palm OS Terminal SPT 18XX Series
Palm OS platform, integrated miniature scan engine, Dragon Ball VZ - 33 MHz, Rugged housing meets IP54 Standards, 8 RAM and 4Mb of ROM, High-contrast liquid crystal display with enhanced backlight, 1-hour Ni-MH backup battery, 1.2 m drop to concrete, IrDA port, Kit Inc Stylus, Slip Case, Lithium Ion Battery & Quick Reference Guide and Cradle

Mobile Sales Software (VAN0016) \$505

Symbol Palm (VAN0025) \$1795



Our Price \$2149 **Save \$346**

WebCode BUN0009

Posiflex PP-5600 DOT Matrix Receipt Printer

This low-cost Dot Matrix Receipt Printer allows for rapid speed printing with up to three duplicate copies for each receipt issued.

- Tear off cutter blade
- Approx 3.5 lines per sec.
- 20Kb input buffer
- Power supply and data cable included
- ESC/POS command compatible



Our Price \$352 **Save \$73**

WebCode POS0019

Posiflex CD-3830 Barcode Scanner Series

With enhanced performance this long-distance barcode reader has a simple cable configuration. Simply plug into your PC and make barcode reading fast and efficient. Includes upright hands-free stand.



Our Price \$209 **Save \$186**

WebCode POS0021

Wasp Mobile Inventory Software Bundle

Wasp MobileInventory equips you to manage and track your inventory using your desktop PC and your Palm OS or WindowsCE.NET handheld Desktop Features:

- Efficiently manage physical inventory
- Check-in/Check-out inventory items
- Track your inventory by item location, purchase order, supplier, serial number, lot, pallet & date code
- Effortlessly manage location information for each item
- Customise your forms to present only the information that's important to your business
- Define text, numeric, and date fields
- Create, customize & print labels with the integrated Wasp Labeler software

Symbol Palm OS Terminal SPT 18XX Series
Palm OS platform, integrated miniature scan engine, Dragon Ball VZ - 33 MHz, Rugged housing meets IP54 Standards, 8 RAM and 4Mb of ROM, High-contrast liquid crystal display with enhanced backlight, 1-hour Ni-MH backup battery, 1.2 m drop to concrete, IrDA port, Kit Inc Stylus, Slip Case, Lithium Ion Battery & Quick Reference Guide and Cradle

Mobile Inventory Software (VAN0017) \$662

Symbol Palm (VAN0025) \$1795



Our Price \$2299 **Save \$296**

WebCode BUN0010

Posiflex PP-7000 "Aura" Thermal Receipt Printer

The Posiflex PP7000 Thermal Receipt Printer will give your store a professional image with receipts issued at high speed. Easy Drop and Load paper loading.

- High-speed - silent operation
- Up to 180mm per sec
- Auto paper cutter
- Stores graphic logo
- Power supply and data cable included
- ESC/POS command compatible



Our Price \$484 **Save \$211**

WebCode POS0018

PSC VS800 Omni Directional Bench Scanner

Compact Design, Advanced visible laser scanner system, 20cm scanning depth of field, wide scan area, high first pass read rate, scans a variety of barcodes, includes power supply and cable.



Our Price \$496 **Save \$154**

WebCode PSC0006

RENT SMART
Because buying isn't

SEE PAGE 3 FOR DETAILS

Telstra 5100 DECT Cordless Phone

- Calling number display (type 2)
- 50 name and number phonebook
- Multi-handset
- Call waiting button
- Flash message indicator



Our Price **\$50** **Save \$10**
WebCode CLS5100

Telstra 5150 DECT Cordless Phone

- Integrated digital answering machine with 11 min recording time
- Calling Number Display
- Option to connect 5 handsets to one base unit
- Flashing Message Indicator
- 50 name & number Phonebook
- Adjustable handring ring volume & melodies
- Handsfree on handset
- Answering machine remote access



Our Price **\$83** **Save \$17**
WebCode CLS5150

Telstra F5500 Cordless Telephone

- Send and Receive SMS
- Handsfree on handset
- 150 name and number phonebook
- Calling Number display
- Colour graphical display
- Sim card reader
- Handsfree headset included
- Option to connect 5 handsets to one base unit



Our Price **\$141** **Save \$29**
WebCode CLS5500

D-Link Wireless Internet/Security Camera (DCS-900W)

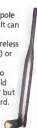
The D-Link DCS-900W is an entry-level Wireless Internet Camera which connects to either 802.11b Wireless or 10/100Mbps Fast Ethernet networks. The DCS-900W features a built-in web server, which means that you do not need to have a computer to stream video images directly to the Internet. The software package bundled with the DCS-900W provides basic security features, with monitoring capability of up to 4 cameras and recording to hard drive.



Our Price **\$317** **Save \$82**
WebCode DLK1212

D-Link Indoor 5dBi Wireless Omni-Directional Antenna (DWL-50AT)

The D-Link DWL-50AT is a 5dBi Gain Dipole Antenna with Reverse SMA connector. It can help to improve the transmit rate and extend the transmit distance of wireless access point (DWL-1000AP, DWL-900AP) or wireless gateway router (DG-714) which have a reverse SMA connector. To ensure a better performance, you should not only improve the RF on transmitter but also that on receiver, i.e. a high gain card.



Our Price **\$29** **Save \$6**
WebCode DLK01010

D-Link 1 port Print Server USB printer (DP-301U)

A compact print server that connects to your Ethernet or Fast Ethernet network. With its high-speed USB port, the DP-301U allows those on your network to access and share a USB printer no matter where they reside on the network. Compact in size, it's equipped with one USB version 1.1 port for seamless connection to most USB printers and supporting all major network Operating Systems and protocols.



Our Price **\$132** **Save \$27**
WebCode DLK1598

D-Link Hardware accelerated Audio/Video Converter (DUB-AV300)

The DUB-AV300 is an audio/video converter with built-in hardware encoder as well as advanced video display & capture of analog camera, camcorder or VCR. Also supports MPEG1/2/4 Compression on the fly.



Our Price **\$156** **Save \$44**
WebCode DLK9975

D-Link Internet/Security Camera with 2-Way Audio (DCS-3220)

A versatile security system that allows you to watch, listen and talk remotely. The camera connects to an Ethernet network, and to broadband Internet. Equipped with a high-quality CCD sensor, zoom, 2-way audio capability and advanced software functions for multi-camera monitoring and management, this camera provides a comprehensive system for surveillance.



Our Price **\$629** **Save \$140**
WebCode DLK9247

D-Link Indoor 6dBi Wireless Directional Antenna (ANT24-0600)

The ANT24-0600 2.4GHz Directional Antenna is a range extender antenna that provides output 2 to 2.5 times higher than that of the 2dBi dipole antennas normally bundled with wireless LAN devices. The ANT24-0600 antenna works with all access points and remote routers equipped with an RP-SMA or RP-TNC connector.



Our Price **\$80** **Save \$19**
WebCode DLK0140

D-Link 1 port Print Server Parallel printer (DP-301P)

Compared to software-based printer sharing, the DP-301P+ eliminates the need to have your printer connected to a host computer. With the DP-301P+, everyone on your network can be sure that their printing jobs go through at any time. Documents also print faster from the DP-301P+ than from software-based printer sharing solutions.



Our Price **\$112** **Save \$27**
WebCode DLK0552

D-Link 5 port Gigabit Switch (DGS-1005D)

Get the blazing speed of Gigabit Ethernet with the DGS-1005D, an 5-port 10/100/1000Mbps Gigabit Switch that delivers power, performance, and reliability in a cost-effective, space-saving design. Increase the speed of your network server and backbone connections, or make Gigabit to the desktop a reality. Transfer graphics, CGI, CAD, or multimedia files across the network instantly.



Our Price **\$136** **Save \$40**
WebCode DLK0666

D-Link Wireless Internet/Security Camera with Pan/Tilt & Audio (DCS-5300G)

The DCS-5300G Wireless Internet Camera is an advanced security system that allows you to watch and listen remotely. It provides you with high-quality video and audio. Equipped with built-in LAN server, a micro-phone and a motor for rotation, this camera can be panned, tilted and zoom remotely, accessed and controlled from any PC/notebook over a local network or through the Internet.



Our Price **\$919** **Save \$210**
WebCode DLK9248

D-Link Indoor 7dBi Wireless Omni-Directional Antenna (ANT24-0700)

The ANT24-0700 is a High-Gain omni-directional antenna designed for 2.4GHz ISM band indoor use. It can be used with 802.11b and 802.11g wireless LAN devices such as access points and remote routers. It can be connected to your wireless device through an extension cable (provided with the antenna), or directly attached to your wireless device.



Our Price **\$79** **Save \$20**
WebCode DLK9245

D-Link Wireless 802.11g Print Server - USB printer (DP-G310)

The Wireless Print Server is the ideal network printing solution for small offices, home offices, schools and other businesses that require printer sharing. With its high-speed USB port, the DP-G310 allows those on your network to access and share a USB printer wirelessly no matter where they reside on the network. Equipped with one USB version 2.0 port for seamless connection to most printers.



Our Price **\$220** **Save \$49**
WebCode DLK1054

D-Link 4 port USB 2.0 + 3 port FireWire Hub (DFB-H7)

The D-Link DFB-H7 USB 2.0/FireWire Combo Hub is a combination 6-port USB 2.0 and 1394 FireWire hub that brings together two popular high-speed technologies for an all-in-one, high-speed, high performance solution for digital media peripherals.



Our Price **\$77** **Save \$12**
WebCode DLK0133

D-Link 54Mbps Wireless Travel Router (DWL-G730AP)

The D-Link AirPlusG DWL-G730AP is a portable and convenient wireless solution for the traveling business person delivering 802.11g wireless connectivity with a maximum wireless signal rate of up to 54Mbps. Use it in conference rooms, hotel rooms, or even at hotspots. The DWL-G730AP can be used as an access point, router or wireless client.



Our Price \$142 Save \$38
WebCode: DLK5240

D-Link Wireless Media Player (DSM-320)

The DSM-320 unites your network with your home entertainment center, allowing you to share, access, and enjoy your digital media. Whether it is music, videos, or photos in the comfort of your living room. The DSM-320 supports 802.11g wireless standards with transfer speeds up to 54Mbps, giving you maximum throughput for your digital media.



Our Price \$352 Save \$48
WebCode: DLK0129

D-Link TV Tuner with Remote Control (DUB-T210)

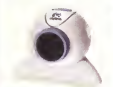
The D-Link DUB-T210 provides two convenient functions for PC users. It connects your analog camera, camcorder and VCR to your PC to convert analog to digital image/sound for editing, and it connects to your PC to your cable TV line to let you view TV programs on your computer screen and save these programs in digital AVI or compressed MPEG formats on your hard disk or CD ROMs.



Our Price \$152 Save \$41
WebCode: DLK9249

Logitech Quickcam Express

Now you can meet face-to-face online with live video calls. Or make your instant messages come alive by adding live video to your MSN Messenger or Yahoo! Messenger. Or set up a webcam to share your world. Or snap and send photos and video along with your e-mail as easily as you send text.



Our Price \$45 Save \$25
WebCode: LOG3412

D-Link 54Mbps Wireless Broadband Router (DI-624+)

The DI-624+ is a high-speed 2.4GHz 802.11g wireless broadband Router with a built-in 4-port Fast Ethernet Switch. It incorporates high-speed wireless LAN with speeds of up to 54Mbps. This router lets you quickly share DSL or cable modem Internet connection, with or without the network wires.



DI-624 100Mbps Our Price \$159 Save \$41
WebCode: DLK5403

DI-624+ 54Mbps Our Price \$128 Save \$39
WebCode: DLK5407

D-Link 54Mbps Wireless PCI Adapter (DWL-G520+)

The DWL-G520+ wireless PCI card is an enhanced 802.11g high-performance, wireless card for desktop computers. This card supports high-speed wireless networking of up to 54Mbps, while providing seamless interoperability with all existing 802.11b and 802.11+ wireless equipment.



DWL-G520 100Mbps Our Price \$80 Save \$20
WebCode: DLK5400

DWL-G520+ 54Mbps Our Price \$65 Save \$27
WebCode: DLK9991

D-Link 54Mbps Wireless USB Key (DWL-G122)

A high-performance 802.11g wireless LAN USB adapter that connects your computer to a high-speed wireless LAN. This adapter simply plugs into your computer through a fast USB 2.0 interface to provide up to 54Mbps wireless speed. This adapter is an ideal solution for notebook and laptop PC users needing a fast and standard mobile network connection.



DWL-G122 11Mbps Our Price \$63 Save \$17
WebCode: DLK0396

DWL-G122 54Mbps Our Price \$75 Save \$15
WebCode: DLK1153

Logitech USB Microphone

No drivers to download and no worries... that's easy plug-and-play, and that's what you get from the Logitech USB Desktop Microphone. You also get true digital quality and a noise-canceling technology to filter out unwanted background noise and deliver better voice recognition, better voice command, better voice recording, and more.



Our Price \$30 Save \$20
WebCode: LOG3286

D-Link Wireless PCMCIA Card (DWL-G650+)

This adapter supports high-speed wireless networking of up to 54Mbps, while providing seamless interoperability with all existing 802.11b and 802.11+ wireless equipment. This adapter is the ideal wireless solution that offers an upgrade to a fast, new technology while protecting your past investments through interoperability with your current network equipment.



DWL-G650 100Mbps Our Price \$76 Save \$24
WebCode: DLK5401

DWL-G650+ 54Mbps Our Price \$59 Save \$20
WebCode: DLK5405

D-Link 54Mbps Wireless VPN Router with Print Server (DI-824VUP+)

A 802.11g wireless VPN router that combines broadband Internet sharing with robust VPN firewall security, print server and built-in 4-port switch for ready printer and workstation connection.



Our Price \$270 Save \$80
WebCode: DLK9921

D-Link 8-Port 10/100Mbps Switch (DES-1008B)

D-Link DES-1008B is an unmanaged 10/100Mbps switch designed to enhance small group performance while providing a high level of flexibility. Plug any port to either a 10Mbps or 100Mbps network to multiply bandwidths, boost response time and satisfy heavy data demands. 8-port 10/100Mbps Auto-sensing.



Our Price \$63 Save \$17
WebCode: DLK0405

Connectland Mini 2.1CH USB Speakers

The Connectland Mini 2.1CH USB Speakers is an innovative way to boost the sound and multimedia capabilities of your notebook. Compact Design - a compact speaker system that you can easily carry along with your laptop. High Quality Sound - newly developed built-in class D, 1 bit digital amplifier outputs clear digital sound.



Our Price \$49 Save \$45
WebCode: CL00001

D-Link Router With Built-in Switch & USB Print Server (DI-704UP)

A versatile router that combines broadband built-in Internet sharing with robust firewall security, print server and built-in 4-port switch for ready printer and workstation connection. For home and SOHO, as well as for business users looking for advanced functions, network protection and policy-based content filtering.



Our Price \$102 Save \$28
WebCode: DLK1115

D-Link USB/Ethernet ADSL Modem (DSL-502T)

Using ADSL technology, your Internet speeds can be up to 150 times faster than a 56K analog modem over a standard phone line. Two computers can simultaneously connect via the USB and Ethernet port to share its high-speed Internet connection. You can connect to its Ethernet port regardless of the operating system you are using, or connect to its USB port to allow easy installation to a USB equipped computer running Windows 98SE, Me, 2K, X8 or Mac OS 9 and OS X.



Our Price \$94 Save \$26
WebCode: DLK9977

D-Link ADSL Modem with 54Mbps Wireless Router (DSL-G604T)

With a built-in ADSL interface, 802.11g high-speed wireless LAN, 4 10/100BASE-T Ethernet switch ports and advanced router functions, this device gives your business a convenient and cost-effective way to install a secure, fast network with bottleneck-free link to the outside world. The DSL-G604T is an ADSL Router designed for home or office use.



Our Price \$172 Save \$28
WebCode: DLK1109

Avision AV210 A4 Doc Scanner with ADF

The new Avision AV210 scanner is designed to occupy minimum desk space and features 20 ppm scanning, USB 2.0 interface and 48 bit colour which is exceptional considering their high scanning speed and modest price.



Our Price **\$729** Save **\$40**
WebCode PRS0007

Avision 8000s Flatbed A3 Scanner

The AV8000s comes as a flatbed scanner with or without an automatic document feeder. With the document feeder attached, the AV8000s is capable of scanning up to 35 pages per minute and is able to hold up to 50 pages at once. To make scanning even more effortless, the AV8000s comes packaged with a SCSI interface kit, TWAIN drivers and a comprehensive software collection for Windows.



Our Price **\$2345** Save **\$150**
WebCode AV10006

Digimemo Digital Notepad

The Digimemo AS01 is the world's first and unique standalone device with storage capabilities that digitally captures and stores everything you write or draw with ink on ordinary paper, without the use of computers and special papers. Then, you can view, organize and share (e-Mail) your handwriting notes in Windows.



Our Price **\$159** Save **\$10**
WebCode ANY0056

Linksys Wireless-G Broadband Router (WRT54G)

- All-in-one Internet-sharing Router, 4-port Switch, and Wireless-G Access Point
- Wireless data rates up to 54Mbps—5 times faster than Wireless-B (802.11b)
- Shares a single Internet connection and other resources with Ethernet wired and Wireless-G clients
- Also Interoperates with Wireless-8 Devices



Our Price **\$128** Save **\$31**
WebCode LNK0009

Linksys ADSL Gateway (AG241)

- High-speed ADSL Modem gives you a fast, "Always On" connection to the Internet
- Connect your PCs via the built-in Router and 4-port Switch to jump start your Ethernet network and share the Internet throughout your household
- Advanced firewall and security features protect your PCs, your data, and your family
- Compatible with both ADSL1 or ADSL2 standards



Our Price **\$142** Save **\$47**
WebCode LNK0241

Linksys Wireless-G USB Card (WUSB54G)

- Connects your desktop or notebook to a wireless network at up to 54Mbps when used with a USB 2.0 port
- Easy, no-tools setup on any desktop or notebook computer with USB support
- Also compatible with Wireless-B networks (at 11Mbps)
- Wireless communications are protected by up to 128-bit data encryption



Our Price **\$79** Save **\$20**
WebCode LNK0051

Linksys Network Storage Link (NSL2U)

Connect a USB Hard Drive or Memory Stick to the new Linksys Network Storage Link and everyone with permission can access the drive. Share company data across the network, or use it at home for a central library of pictures or music! You can even access the drive from the Internet when you're away!



Our Price **\$162** Save **\$37**
WebCode LNK0134

Linksys Wireless-G ADSL Gateway (WAG54G)

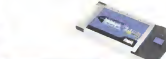
- High-speed ADSL Modem gives you a fast, "Always On" connection to the Internet
- Connect your PCs via the built-in Router and 4-port Switch to jump start your Ethernet network and share the Internet throughout your household
- Built-in Wireless-G (802.11g) Access Point also lets you connect without running wires



Our Price **\$202** Save **\$47**
WebCode LNK0075

Linksys Wireless-G Notebook Adapter (WPC54G)

- High-speed Wireless-G (802.11g) networking for your notebook computer
- Data rates up to 54Mbps—5 times faster than Wireless-B (802.11b)
- Also Interoperates with Wireless-8 networks (at 11Mbps)
- Advanced wireless security: Wi-Fi Protected Access (WPA), up to 256-bit encryption



Our Price **\$78** Save **\$21**
WebCode LNK0008

Linksys Wireless-G Range Extender (WRE54G)

- The easiest way to expand your wireless network's coverage
- Save on wiring costs—no wired connection to your network necessary
- Extend your wireless signal into hard-to-reach areas
- Compatible with both Wireless-G and Wireless-B networking clients



Our Price **\$123** Save **\$42**
WebCode LNK0128

Linksys Wireless-G SRX Internet Sharing Router (WRT54G)

- Internet-sharing Router, 4-port Switch, with a built-in speed and range enhanced Wireless-G (802.11g) Access Point
- Shares a single Internet connection and other resources with Ethernet wired, Wireless-G, -B, and other SRX devices
- New SRX technology: the farther away, the more advantage—up to 8 times faster than standard Wireless-G (802.11g)



Our Price **\$313** Save **\$66**
WebCode LNK0242

Linksys ADSL Modem (ADSL2MUE)

- High-speed ADSL modem gives you a fast, "always on" connection to the Internet
- Up to 12 Mbps download speeds, 200 times faster than dial-up analog modems
- Shares your existing telephone lines to connect to the Internet, without tying up the phone
- Connects to your PC over 10/100 Ethernet or USB



Our Price **\$97** Save **\$38**
WebCode LNK0244

Linksys Wireless-G PCI Card (WMP54G)

- Wireless-G (802.11g) connectivity for your desktop PC
- Incredible data rates up to 54Mbps in the 2.4GHz radio band
- Also Interoperates with Wireless-B (802.11b) networks at 11Mbps
- Put your PC wherever you want, with no cabling hassle



Our Price **\$78** Save **\$21**
WebCode LNK0007

Linksys Wireless-g Internet Video Camera (WVC54G)

- Sends a high-quality live audio/video stream to your network wirelessly over 802.11g—viewable from anywhere
- Built-in stand-alone web server, no PC necessary
- Built-in Mode automatically sends email alerts with video clips upon motion detection
- Supports up to four simultaneous remote users



Our Price **\$353** Save **\$126**
WebCode LNK5400

Linksys Wireless-G SRX Network Adapter (WPC54G)

- High-speed Wireless-G networking for your notebook computer, now with SRX performance enhancement
- New SRX technology: the farther away, the more advantage—up to 8 times faster than standard Wireless-G (802.11g) SRX also increases wireless range by up to 3 times and reduces dead spots in coverage area
- Interoperates with standard Wireless-G and Wireless-8 networks



Our Price **\$190** Save **\$39**
WebCode LNK0243

**EPSON****Canon****WACOM****Input Devices****RENT SMART**
Because buying isn't

SEE PAGE 3 FOR DETAILS

HP Scanner ScanJet 3770

Slim but reliable, the HP ScanJet 3770 easily digitizes photos, documents and other items with impressive detail and sharpness. Scanning at up to 1200 x 2400 hardware resolution and 48-bit colour, it gives you brilliant true-to-life images that can be easily optimised to produce high-quality photo prints.



Our Price \$223 Save \$51
WebCode: HPS1915

Epson Perfection 2480 Photo Scanner

- Outstanding 2400 x 4800 dpi resolution with Matrix CCD technology and On-Chip Micro-Lens
- Integrated Transparency-Unit (TPU) for faster scanning of strip film and slides
- Improved EPSON Scan driver, featuring photo restoration tools



Our Price \$265 Save \$54
WebCode: EPS2480

Canon Scanner CanoScan LIDE 20

- 600 x 1200 dpi optical resolution and 48-bit colour
- Simple to connect - one plug scanning with Canon's user-friendly interface allows one touch operation of common scanning tasks
- New PDF compatible function
- Advanced 2-Lid



Our Price \$88 Save \$11
WebCode: CAN0083

Netgear (WPN824) RangeMax Wireless Router

Powered by 7 smart antennas which adapt on-the-fly to interference, eliminating dead spots and delivering up to 10x more wireless coverage and speed than basic 802.11g routers. RangeMax MIMO (Multi-In, Multi-Out) technology is 100% 802.11b/g compatible and provides legacy devices with up to 50% improvement in performance.



Our Price \$188 Save \$61
WebCode: NTG7317

HP ScanJet 5590 Digital Flatbed Scanner

- Unattended two-sided, multi-page scanning with ADF
- Scan up to 8 ppm (4 ipm) and preview scan in about 7 seconds
- Resolution: 2400 dpi
- Colour depth: 48-bit
- USB 2.0 Connectivity



Our Price \$895 Save \$204
WebCode: HPS1910

Epson Perfection 4990 Photo Scanner

- High Optical Density of 4.0 - for incredibly accurate colour tone capture
- High Resolution - 4800 dpi resolution using Matrix CCD Micro Lens Technology
- Advanced Film Scanning - new wider scanning area moving carriage-type Transparency Unit (TPU)



Our Price \$784 Save \$162
WebCode: EPS4990

Canon Scanner CanoScan 9950F

- 4800 dpi Hyper CCD IV sensor with 48-bit colour depth
- Scan up to 30 frames of 35mm filmstrip in a single pass, 12 x 35mm slides, medium and up to 5" x 4" large format film
- USB 2.0 Hi-Speed/FireWire (IEEE1394) dual interface
- Automatic dust, scratch, fading, graininess and backlight correction technology (FARE Level 3) for film scanning



Our Price \$704 Save \$95
WebCode: CAN0036

Netgear (WPN511) RangeMax Wireless PC Card

Use with the WPN824 Wireless Router for 1000% the coverage and speed of 802.11g. Because there are no more dead spots, you can place your desktop PC anywhere in your home without the need for repeaters or boosters. Keep your network secure with included WEP and WPA security settings.



Our Price \$112 Save \$37
WebCode: NTG7327

Wacom Graphire3 Digital Photographic Toolkit

The Graphire3 6x8 Digital Photographic Toolkit. The Digital Photographic Toolkit is specifically designed to meet the needs of Digital Photographers, by maximising the fun and ease of manipulating and sharing Digital Photos. The Graphire3 6x8 Digital Photographic Toolkit comes in a limited edition silver colour, with software which creates a Seamless Digital Photographic workflow.

Included Software

- Ulead Photo Explorer 8 SE Basic
- Adobe Photoshop Elements 2.0
- Wacom Express 4 SE for Wacom
- Corel Painter Essentials 2



Our Price \$210 Save \$39
WebCode: WAC047

Wacom PenPartner

The pen tablet perfect for Microsoft Office applications. Make notes and insert signatures, annotate your PowerPoint presentations, use handwriting recognition features and much more. Includes JustWrite Office for easy document mark-up and annotation.



Our Price \$55 Save \$25
WebCode: WAC0108

Wacom Intuos3

The Intuos3 extends the functionality of Wacom's pen tablets and introduces an exciting new look and innovative tablet features for improved workflow. The enhanced Intuos3 look-and-feel is improved by with new industrial design including an elegant transparent surface with a matte-finish active area, a new Grip Pen design, and a new two-position pen standholder.

Wacom's new Intuos3 Grip Pen is more comfortable to hold, and features 1024 levels of tilt and eraser pressure, tilt, angle and direction, and two side buttons that act as modifier keys, keystrokes, or mouse buttons. As with all Intuos3 tools, the pen's functionality is completely customizable through Wacom's Control Panel software.

Additional functionality is provided through new programmable buttons called ExpressKeys and an innovative, integrated Touch Strip. The ExpressKeys are four programmable keys designed to optimize workflow by providing quick access to commonly used modifiers, mouse clicks, keystrokes, and other time-saving operations.



Our Price \$308 Save \$41
WebCode: WAC0430

Our Price \$484 Save \$65
WebCode: WAC0630

Our Price \$605 Save \$144
WebCode: WAC0930

Our Price \$111 Save \$38
WebCode: NTG7316

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KONICA MINOLTA

Netcomm USB Ethernet Mini Print Server

The NP3645 USB Ethernet Mini Print Server is a stand-alone print server that connects direct to a USB printer for efficient print sharing. It supports most USB printers including laser, colour and bubble jet and offers a USB port, which connects direct to the printer, an Ethernet port to connect to the network.



Our Price \$147 **Save \$18**
WebCode...NET9312

Plantronics Stereo PC Headset with Microphone

This headset is equipped with convenient inline volume and mute controls and a quickadjust microphone boom for correct placement. Noise cancelling microphone has superior speech recognition for internet telephony and video conferencing.



Our Price \$49 **Save \$17**
WebCode...PT50001

Check out our huge range of ink and toner cartridges on page 29!



Fuji Xerox DocuPrint C525 A4 Colour Laser Printer

- Black Print Speed 25ppm
- Colour Print Speed 5ppm
- First Page Out 9 Sec Black 17 Sec Colour
- Memory Size 64MB
- Max Duty Cycle 45,000 ppm
- Resolution 9600 x 600 image enhancement
- Paper capacity 250 sheets Std / 950 Max



Our Price \$672 **Save \$125**
WebCode...FXP5250

Fuji Xerox DocuPrint C2428 A3 Colour Office Printer

- 24 ppm in colour or black and white. First page out in 12 seconds.
- True 1200 x 1200 dpi resolution at full rated speed.
- A 350MHz Power PC 603e processor, 32 bits/66MHz PCI bus and 128MB RAM as standard.
- 10/100BaseT network support.



Our Price \$4811 **Save \$903**
WebCode...FXP2428

Fuji Xerox DocuPrint 240A A4 Black & white Office Printer

- 24 ppm, first page out in 10 seconds.
- Full engine speeds at true 1200 x 1200 dpi resolution.
- A 266MHz RISC
- PowerPC603e processor and 64mb standard memory.
- 10/100BaseT network support as standard.
- 75,000 maximum monthly duty cycle.



Our Price \$1200 **Save \$224**
WebCode...FXP240A

Fuji Xerox Phaser 5500 A3 Black & white Office Printer

- 50 ppm 1-sided, first page out time 3 seconds (in ready mode)
- 500 MHz Engine Controller and standard 128MB with the option of up to 512MB of memory.
- Up to 300,000 pages monthly duty cycle.
- Edge-to-edge printing, collating, N-up and booklet printing.
- Up to A3 and tabloid, 60 to 216 gsm
- Takes care of itself - Web based admin tools offer easy printer management.



Our Price \$4903 **Save \$922**
WebCode...FXP5500

Fuji Xerox DocuPrint C2535 A Colour Laser Printer

- Black Print Speed 35ppm
- Colour Print Speed 25ppm
- Memory Size 128MB upgradeable to 640MB
- Max Duty Cycle up to 90,000ppm
- Resolution Up to 1200 x 1200 dpi
- Paper capacity 700 sheets Std / 2350 Max

NEW



Our Price \$2959 **Save \$556**
WebCode...FXP2535

Fuji Xerox Phaser 7300 A3 Colour Office Printer

- First page out 16 seconds colour, and 13 seconds black and white
- Print speeds of up to 30 ppm colour and 37 ppm black and white.
- 500 MHz processor, 192MB Std upgradeable to 512MB of RAM.
- Monthly duty cycle of 83,000 pages, up to 2400 dpi



Our Price \$7838 **Save \$955**
WebCode...FXP7300

Konica Minolta Magicolor® 2430DL

Imagine a compact colour laser printer that everyone can share! Whole workgroups can benefit from cost effective colour printing with the magicolor 2430DL. It is exceptionally easy to use and integrates direct photo print for fast and easy printout of pictures. With revolutionary engineering and stylish design, the magicolor 2430DL is a welcome addition to any networking environment.

- Memory: 32 MB RAM
- Warm-up time: 40 seconds
- Print Speed: 5 ppm colour (A4/letter), 20 ppm monochrome (A4/letter)
- Print Quality: Superior resolution 2400 x 600 dpi, High quality Polymerised toner
- Standard Interfaces: Ethernet 10/100 BaseTX & USB 2.0, Supporting Microsoft® Plug and Play
- Paper size and input: Standard 200-sheet multipurpose feeder
- Operating System Compatibility: Windows 98SE/ME/2000/XP, MAC, LINUX
- Warranty: 2 year on-site warranty
- Direct Photo Print: Print photographs without a PC

NEW



Our Price \$808 **Save \$91**
WebCode...QM52430

Konica Minolta PagePro 1300W

The PagePro 1300W is compact reliable and fast and ideal for both the home and the office.

The PagePro 1300W prints 16ppm, and at approx 2cents per page it is also value for money.

- Paper size A4
- Print speed 16 ppm
- Paper input 150 sheets
- Paper output 100 sheets
- Print resolution 1200x1200dpi
- Memory 8 MB std
- Standard Parallel and USB
- Warranty: 3 year replacement, including drum.

NEW



Our Price \$224 **Save \$25**
WebCode...QM51300

Konica Minolta Magicolor® 5440DL

The 5440DL has colour printing speeds faster than most monochrome printers and comes standard with networking capabilities

The 5440DL, as all Konica Minolta printers uses polymerized toner and most importantly is value for money!

- Up to 27 ppm colour & mono
- 64mb RAM, upgradeable
- Support for Windows, XP/MAC OS LINUX
- Standard input tray of 500 sheets

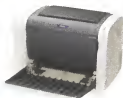
NEW



Our Price \$1871 **Save \$463**
WebCode...QM55440

Epson EPL-6200L

- 600 x 600 dpi
- 20ppm black
- 32MB RAM, Up to 128MB RAM
- 150 sheet tray, Optional 500 sheet tray
- Parallel/USB
- Win/Mac



Our Price \$347 Save \$71

WebCode: EPL6203

Epson Colour AL-C1100

- 600 x 600 dpi
- 25ppm black, 5ppm colour
- 32MB RAM, Up to 256MB RAM
- 180 sheet tray, Optional 500 sheet tray
- New EPSON AcuBrite toner
- Parallel/USB
- Win/Mac



Our Price \$711 Save \$147

WebCode: EPL1101

Epson Colour AL-C1100N

- 600 x 600 dpi
- 25ppm black, 5ppm colour
- 32MB RAM, Up to 256MB RAM
- 180 sheet tray, Optional 500 sheet tray
- New EPSON AcuBrite toner
- Parallel/USB
- Networkable
- Win/Mac



Our Price \$800 Save \$179

WebCode: EPL1113

Lexmark E230 Mono Laser Printer

- 600 X 600dpi
- 17ppm black
- 8MB RAM
- 250 sheet tray
- Parallel & USB 2.0
- Win/Mac



Our Price \$176 Save \$131

WebCode: LEX9230

Epson Colour AL-C3000N

- 600 x 600 dpi
- 24ppm colour & monochrome
- 64MB RAM
- 133 MHz
- 100 sheet multi-purpose tray
- USB 2.0 compatible / Ethernet
- Networkable
- Win/Mac



Our Price \$1914 Save \$396

WebCode: EPL3000

Epson EPL-N3000

- 600 x 600 dpi
- 34ppm black
- 64MB RAM
- 150 sheet multi-purpose tray
- Parallel/USB
- Networkable
- Win/Mac



Our Price \$2086 Save \$433

WebCode: EPL3006

Epson Colour AL-C4100

- 600 x 600 dpi
- 24ppm Monochrome & Colour
- 64MB RAM
- 400 MHz RISC + dedicated ASIC processor
- 100 sheet multi-purpose tray
- Parallel/USB
- Win/Mac



Our Price \$3090 Save \$639

WebCode: EPL4103

Lexmark C510 Colour Laser Printer

- Print Speed: 30 PPM in Black and 8 PPM in Color
- Resolution: 2400 x 2400 DPI (Dots Per Inch)
- Paper Handling: Total Capacity: 250 sheets, Max Capacity: 780 sheets
- Memory: 128 MB RAM (Expandable to 320 MB RAM)
- Connectivity: USB, Fast Ethernet (10/100 Base T)
- Environments: Microsoft Windows, Apple Mac OS X, Unix, Linux



Our Price \$681 Save \$308

WebCode: LEX9510

HP LaserJet 1015

- 600 x 600 dpi
- 14ppm black
- 16MB RAM
- 150 sheet tray
- Parallel/USB
- Win/Mac



Our Price \$377 Save \$88

WebCode: HPL2462

HP LaserJet 1320

- Prints up to 22 ppm
- 1200 x 1200 dpi resolution
- 16MB expandable to 144MB
- Input tray - 250 sheets
- Up to 10,000 pages per month duty cycle
- 1 USB 2.0 port



Our Price \$673 Save \$162

WebCode: HPL5927

HP Colour LaserJet 2550N

- 600 x 600 dpi
- 12ppm black, 4ppm colour
- 64MB RAM
- Up to 875 sheet input
- Ethernet ready
- Win/Mac



Our Price \$1370 Save \$334

WebCode: HPL3704

Lexmark T430 Mono Laser Printer

- 1200 x 1200dpi
- 30ppm black
- 32MB RAM
- 250 sheet tray
- Parallel & USB 2.0
- Win/Mac



Our Price \$1014 Save \$184

WebCode: LEX1430

HP LaserJet 4250

- 1200 x 1200 dpi
- 43 ppm black
- 48MB RAM
- 600 Sheet input
- Parallel/USB
- Ethernet Optional
- Win/Mac



Our Price \$1652 Save \$382

WebCode: HPL5400

HP Colour LaserJet 3700

- 600 x 600 dpi
- 16ppm black & colour
- 64MB RAM
- Up to 350 sheet input
- Parallel/USB
- Win/Mac



Our Price \$2575 Save \$604

WebCode: HPL1321

HP Colour LaserJet 5500DN

- 600 x 600 dpi
- 27ppm Black & Colour
- 160MB Memory
- 600 Sheet Input
- A3 Printing Capacity
- Win & Mac



Our Price \$7273 Save \$1681

WebCode: HPL3715

HP Papers

- A4 Everyday Photo Semi Gloss 170gsm 100 Sheets (HPD2511) \$19

Canon Papers

- A4 High Resolution 110gsm 50 Sheets (CAN0068) \$13
- 200 Sheets (CAN0080) \$33
- A3 High Resolution 110gsm 20 Sheets (CAN0111) \$40
- 100 Sheets (CAN0112) \$42

Kodak Papers

- 4" x 6" Picture Paper 20 Sheets (KOD4822) \$10
- 4" x 6" Premium Picture Paper 75 Sheets (KOD6004) \$32
- A4 Everyday Photo Paper 165gsm 20 Sheets (KOD6695) \$10
- 100 Sheets (KOD3293) \$35
- A4 Picture Paper Glossy 190gsm 25 Sheets (KOD5448) \$15
- 75 Sheets (KOD5449) \$33
- A4 Premium Picture Paper Glossy 220gsm 50 Sheets (KOD5283) \$33
- A4 Premium Picture Paper Satin 220gsm 15 Sheets (KOD5743) \$15
- 50 Sheets (KOD6793) \$33

Epson Papers

- Photo Quality Inkjet Paper 100 Sheets A4 (EPA5016) \$27
- A3 (EPA5031) \$64
- A3+ (MB064) \$79
- Matte Heavyweight Paper 50 Sheets A4 (EPA1258) \$27
- A3 (EPA5031) \$65
- A3+ (EPA1263) \$83
- Photo Glossy Paper 20 Sheets A4 (ISWEP5373) \$20
- A3 (EPA5058) \$64
- A2 (EPA5046) \$105
- Premium Photo Glossy Paper 50 Sheets 4" x 6" (EPA1729) \$16
- A3 (EPA5005) \$78
- A3+ (EPA5004) \$116

HP Photosmart 375

Experience the freedom of portable photo editing and printing. Thanks to its integrated multi-slot memory card reader and colour graphic display, it's easy to print directly from your camera's memory card - just slot, edit and print. You can add fun borders to a favourite photo or even print video clips. And thanks to its ultra-compact design and optional battery pack, taking the printer everywhere is easy. Simply the ideal photo printer for all your photo printing needs.

- True-to-life 48 photos
- Print photos on-the-go
- 2.5" colour graphic display. Select and edit photos with the large LCD screen. Adjustable for tilt-angle, this screen remains crisp and clear from any angle.
- Multi-slot memory card reader - Supports CompactFlash™ Type I and II, SmartMedia™, Memory Stick®, Secure Digital™, MultiMediaCard™ and xD Picture Card™.
- On-printer editing functions
- Video action printing
- PictBridge compatibility
- Page layout button



Our Price **\$347** Save **\$79**
WebCode HP93419

HP PSC 1610 All in One Printer

With an integrated multi-slot memory card reader and PictBridge compatibility, you can now print photos directly from your all-in-one.

- Print
- Up to 4800-optimised dpi colour
- HP PhotoREt 4 Colour Layering Technology
- HP PhotoREt 4 Colour Layering Technology (with optional 6-link colour printing)
- Up to 1200-rendered dpi black when printing from a computer
- Print method: HP Thermal Inkjet printing
- Language: HP PCL Level 3 Enhanced
- Duty cycle: Up to 3000 pages per month
- Scan
- Up to 1200 x 4800 dpi optical resolution (Up to 19200 dpi enhanced)
- Up to 48-bit colour
- Flatbed
- Copy
- Copy Black copy speed 3: Up to 23 cpm
- Colour copy speed 3: Up to 18 cpm
- Colour copy resolution: Up to 1200 x 4800 dpi
- Reduction/enlargement: 50-400%
- Maximum copies: Up to 50 copies
- Copier settings: Stand-alone copying



Our Price **\$182** Save **\$17**
WebCode HP55587

HP OfficeJet 7210

The HP OfficeJet 7210 all-in-one is designed to deliver professional-quality results and fast performance. Its networking capability allows high performance tools to be shared across up to 5 computers.

- Print
- Up to 4800-optimised dpi colour
- Up to 1200-rendered dpi black
- Duty cycle: Up to 5000 pages per month
- Black Text: Up to 30ppm Up to 9.8ppm Up to 2.1ppm
- Colour Graphics: Up to 20ppm Up to 5.7ppm Up to 2.1ppm
- Fax
- 33.6 Kbps fax modem
- Up to 3 seconds/page at 33.6 Kbps; 110 speed dial; 130-page memory
- Fax features include: Auto fax reduction, auto redialing, speed dialing, PC fax send, optional two-sided faxing
- Scan
- Up to 2400 x 4800 dpi hardware resolution
- Up to 48-bit colour
- Flatbed with duplex Automatic Document Feeder
- Copy
- Copy Black copy speed: Up to 30 cpm
- Colour copy speed: Up to 20 cpm
- Colour copy resolution: Up to 4800 x 1200 dpi



Our Price **\$550** Save **\$109**
WebCode HP55575

Visit www.csw.com.au to view our full range of Printers!

Lexmark X6170

Colour Printing: Up to 4800 x 1200 dpi on all paper types. Up to 19 ppm black; up to 15 ppm colour

Colour Scanning: It offers an effective scan area of 8.5" x 11.7". This high-resolution scanner captures the finest detail, with up to 1200 x 4800 dpi optical resolution (up to 19,200 enhanced) and 48-bit colour scan/16-bit grayscale.

Colour Copying: Reduction/enlargement capability from 25% to 400%. 1-99 copies at one time. The Lexmark X6170 produces up to 16 ppm black and up to 11 ppm colour.

Colour Faxing: 33.6 Kbps fax capability. Automatic document feeder lets you fax multiple page documents.

Accu-Feed: Paper handling system virtually eliminates paper jams.

Bundled software: ABBYY FineReader 5.0 Sprint Plus Optical Character Recognition - FineReader converts scanned paper documents into editable computer files.



Our Price **\$255** Save **\$44**
WebCode LEX6170

Lexmark P6250

Print. Copy. Scan, reduce and enlarge photos and documents. Share your scanned photos by email or easily print them. A 2.5" (63.5mm) colour screen and 4" x 6" photo scan guides make placement and previewing of photos easy.

Bright 6-colour 35mm quality: Borderless prints in sizes A4, A5, A6, Letter, Hagaki, 3.5" x 5", 4" x 6", 5" x 7", L and 2L up to 4800 dpi on Photo paper; 6-colour 4" x 6" photos as fast as 38 seconds when printing in QuickPrint mode and excluding PC processing time.

Quickly print photos without a PC using the PictBridge digital camera interface or your digital camera memory card.

Supports CompactFlash Type I & II, Memory Stick, Memory Stick Pro, Memory Stick Duo with adapter, Multi Media, Secure Digital, SmartMedia, Microdrive and XD cards.

Prints up to 15 ppm colour and up to 22 ppm black with the optional Lexmark black cartridge.

Accu-Feed: Paper handling system virtually eliminates paper jams.



Our Price **\$329** Save **\$70**
WebCode LEX6250

Lexmark X7170

With the Lexmark Productivity Suite, you can manage, organise and search documents with ease; scan and edit documents or printed material (using included ABBYY FineReader Optical Character Recognition (OCR) Software); and easily convert documents to PDFs.

Print fast with up to 22 ppm black & white and up to 15 ppm colour printing with high quality printing up to 4800 dpi on photo paper.

Distribute Multi-page faxes and emails; fax quickly with 1-touch hot buttons and 33.6 Kbps

Enable easy sending of electronic documents with these functions: Up to 100 page memory, 79 speed dials and 20 group dial capability, 5 quick dial buttons on the operator panel, Auto redial, Busy redial, Caller ID and distinctive ring detection (where available), Fax forwarding and print, Confirmation, error and activity reports, Broadcast and delayed transmission, Junk fax block (where available), Integrated print to fax function, Auto answering.



Our Price **\$337** Save **\$62**
WebCode LEX7170



EPSON Multi-Function Machine Stylus Photo RX430

With its high quality photo printing, scanning and copying features, the EPSON STYLUS PHOTO RX430 is an incredibly cost effective and space efficient tool for today's photo enthusiasts. It's designed to take full advantage of the wide range of Genuine EPSON Photo Papers; users will be able to enjoy printing economical, professional photos. The EPSON STYLUS PHOTO RX430 combines the most wanted features in one compact space saving unit. Not only do you receive a high quality scanner, Photocopier and fast printer in one unit, but you also get a high quality photo-printing centre.

- Integrated Memory Card Slots
- Up to 15ppm in black and colour text
- Borderfree printing up to A4
- 4 Individual Ink Cartridges
- Flatbed colour image scanner
- Pixel Depth 48bit
- 1200 x 2400 Optical dpi
- Fast Mono and Colour copying
- USB 1.1 Interface



Our Price \$219 Save \$40

WebCode: EP10430

EPSON Multifunction Machine Stylus Photo RX510

The RX510's superb print quality is made possible by use of EPSON's proprietary MicroPiezo and Variable Sized Droplet Technologies. With a print resolution of 5760 x 1440 Optimised dpi (using Resolution Performance Management) and a scanning resolution of 2400 x 4800dpi, the RX510 is able to reproduce the finest details of all your photos.

- Printing - colour printing at resolutions up to 5760 Optimised and up to 17ppm in black text.
- Print BorderFree edge-to-edge 100 x 150mm & A4 prints.
- Scanning - 48-bit colour depth scanning with optical resolution of 2400 x 4800dpi. Full A4-size (216 x 279 mm) size capability.
- Faxing - Using your existing PC and modem, take full advantage of your existing fax software.



Our Price \$364 Save \$65

WebCode: EP10510

EPSON Multi-Function Machine Stylus Photo RX630

EPSON's Stylus Photo RX630 is the Multi Functional Printer with outstanding photo printing, scanning and photocopying. Underpinning the EPSON STYLUS PHOTO RX630's outstanding photo printing is its 5760 x 1440 Optimised DPI using Resolution Performance Management Technology. With the in-built 2.4 inch LCD preview monitor and easy-to-use control panel, scanned and memory card-stored images can be previewed, cropped and printed without connection to a PC.

- 5760 Optimised DPI
- Up to 17ppm* for black text, and up to 16ppm* for colour text
- Borderfree printing up to A4
- High quality film and slide scanning
- Make Mono and Colour copies
- Copy photo with restoration
- 2.4" High Resolution LCD Viewer Screen
- USB 2.0 hi-speed
- Optional Bluetooth adaptor available



Our Price \$515 Save \$7.50

WebCode: EP10630

Consol USB Cables

- Consol 2 mtr USB 2.0 Peripheral cable type A male-male - 480Mbps (COMB930) \$11
- Consol 3 mtr USB 2.0 Peripheral cable type A male-male - 480Mbps (COMB935) \$14.30
- Consol 5 mtr USB 2.0 Peripheral cable type A male-male - 480Mbps (COMB940) \$19.80



Consol Firewire Cables

- Consol 2mtr IEEE1394 FireWire Cable - 4 pin to 4 pin (COM6105) \$17
- Consol 4.5mtr IEEE1394 FireWire Cable - 4 pin to 4 pin (COM6110) \$24
- Consol 2mtr IEEE1394 FireWire Cable - 6 pin to 4 pin (COM6120) \$16
- Consol 4.5mtr IEEE1394 FireWire Cable - 6 pin to 4 pin (COM6125) \$23
- Consol 2mtr IEEE1394 FireWire Cable - 6 pin to 6 pin (COM6130) \$18
- Consol 4.5mtr IEEE1394 FireWire Cable - 6 pin to 6 pin (COM6135) \$25



Consol Ethernet Patch Cables

- Consol 1 mtr RJ45 Cat5 Enhanced patch cable - Blue (COM7770) \$7
- Consol 5 mtr RJ45 Cat5 Enhanced patch cable - Blue (COM7905) \$15
- Consol 15 mtr RJ45 Cat5 Enhanced patch cable - Blue (COM7995) \$30
- Consol 20 mtr RJ45 Cat5 Enhanced patch cable - Blue (COM8005) \$39



We Stock CAT6 Cables
Image used for illustration purposes only

Visit www.csw.com.au to view our full range of Printers!

Canon Pixma MP110 All In One Printer

The PIXMA MP110 combines an extremely fast 4800 x 1200 dpi printer, stand-alone copier and precise scanner, all-in-one stylish body. The MP110 also features borderless, full-sized printing and copying on A4, 5" x 7" and 6" x 4" paper.

- Quality print, copy, scan made simple
- 2 picolite FINE print-head technology results in sharp and enhanced detail for superb images
- Produce high-definition photos and documents at up to 4800 x 1200 dpi
- Print at up to 18 ppm black and 13 ppm colour
- Copy at up to 16 ppm black and 10 ppm colour
- Scan high-definition prints at up to 1200 x 2400 dpi (9600 dpi optimised)
- Feature the Advanced 2-Lid for convenient scanning and copying of thick documents
- Create true borderless 6" x 4", 5" x 7" and A4 size photos
- Comes with loads of software including Easy-PhotoPrint, Easy-WebPrint5, ArcSoft PhotoStudio and ScanSoft OmniPage SE



Our Price \$143 Save \$16

WebCode: CAN0385

Canon Pixma IP3000 Colour Inkjet Printer

The PIXMA IP3000 Bubble Jet printer is the all-round, affordable home or home office printing solution. It is capable of handling a variety of printing needs from fast document printing at up to 22 ppm black and 15 ppm colour to high quality, borderless photo prints.

- High quality photo printing and advanced page handling
- 2 picolite FINE (Full-photolithography Inkjet Nozzle Engineering) Technology
- Dual paper path (ASF & front cassette)
- Built-in automatic duplexing for double sided printing
- PiCTBridge and Bubble Jet Direct compatible - digital camera printing
- Up to 4800 x 1200 dpi printing resolution
- Prints true borderless photos up to A4
- Prints directly onto printable surface CD and DVD
- Cost saving 4 individual ink tanks



Our Price \$220 Save \$29

WebCode: CAN0313

Canon Pixma MP780 All In One Printer

- High performance printer, copier, scanner & fax.
- 2 picolite FINE (Full-photolithography Inkjet Nozzle Engineering) print-head technology and up to 4800 x 1200 dpi printing
- Print and copy up to 25 ppm black and 17 ppm colour
- Scan at up to 2400 x 4800 dpi (9600 dpi optimised)
- Convenient 35 page Auto Document Feeder (ADF)
- Dual paper path with Auto Sheet Feeder (ASF) and front cassette
- Built-in automatic duplex unit for convenient double-sided printing
- PiCTBridge and Bubble Jet Direct compatible - digital camera printing
- Prints directly onto printable CDs & DVDs
- Super G3 (33.6 Kbps modem) up to 3 seconds per page faxing
- Easy-to-use display and operation panel
- ContrastPLUS 5-colour individual ink system



Our Price \$517 Save \$82

WebCode: CAN0262

Canopus Let's
EDIT 2

Capture home movies, edit them with real-time special effects and burn to DVD. Easy-to-use video editing software with movie-style effects and DVD-Vista authoring. Breakthrough real-time operation dramatically speeds up the editing process, as there is no rendering or waiting while creating movies with sophisticated special effects.



Our Price \$242 **Save \$21**
WebCode: CP50021

Canopus Let's
EDIT RT 2

Capture video from any analog device, such as a VHS deck or Hi8 camcorder, and edit the footage with Let's EDIT 2 software. Featuring the same proprietary DV code chip and local analog technology found in the Canopus ADVC product line, providing unmatched image quality and perfect audio/video synchronization when converting analog video to digital video. Perfect for converting analog footage to digital and creating DVDs from old videotapes.



Our Price \$550 **Save \$49**
WebCode: CP50023

Canopus Let's
EDIT RT+ 2

In addition to the features of Let's EDIT RT 2, Let's EDIT RT+ 2 also features analog video output, which provides video output connectivity to a monitor or television while editing, and also to VHS and Hi8 VCRs and cameras. The native OHCI design with analog video support, offers the widest compatibility with video cameras, decks and even other video editing authoring software applications.



Our Price \$749 **Save \$50**
WebCode: CP50023

Hauppauge
Nova-T USB2

High Definition (HD) and Standard Definition (SD) reception via external USB2 hardware. Record to disk and playback digital TV, very high quality picture and sound schedule, TV recording for later viewing, burn television programmes to DVD (requires DVD burning software.)



Our Price \$209 **Save \$20**
WebCode: HAU0019

Hauppauge Nova T

The Nova T is a High and Standard definition (HD/SD) Digital TV PCI tuner card. The Nova T offers the most incredible picture quality available on a PC tuner card. Digital TV programs can be viewed live, pause/rewind or recorded to hard drive in their full digital quality without any loss. These can then be archived to DVD.



Our Price \$253 **Save \$16**
WebCode: HAU0014

Hauppauge TV Express

Watch live TV or Schedule your recordings, Snap and print stills from whatever you're watching. Or record video clips from your camcorder or off the air to create your own high-impact presentations. The digitized TV image is sent directly into the memory of your PC's VGA card without creating overhead for the CPU. So you can work on applications while simultaneously watching TV in a resizable window.



Our Price \$88 **Save \$11**
WebCode: HAU0017

Hauppauge TV Tuner Cards

Bringing TV and broadcast data to your PC



A.



B.



C.



D.

WebCode	Product Description	Interface	Audio	FM Radio	HW MPEG Recorder	Remote Control	S-Video In	Video In	Audio In	Price
A. HPG0002	WinTV-PVR-350	PCI	DBX Stereo	No	Up to 12MBits/sec	Yes	Yes	Yes	Yes	\$484
B. HPG0001	PVR-150	PCI	DBX Stereo	No	Up to 12MBits/sec	Yes	Yes	Yes	Yes	\$279
C. HAU0004	WinTV-USB2	USB2	Mono	No	Up to 12MBits/sec	Yes	Yes	Yes	Yes	\$209
D. HAU0013	PVR-USB2	USB2	Stereo	Yes	Up to 12MBits/sec	Yes	Yes	Yes	Yes	\$506

Dvico Fusion HDTV USB2

Watch & record HD digital TV on your desktop or notebook PC. Portable, external USB 2.0 device. Record in DVD quality & burn to DVD. Pause & replay live TV with Timeshifting. Supports Electronic Program Guide (EPG). Convert HDTV to MPEG4 format. Includes IR remote control & software.



Our Price \$279 **Save \$20**
WebCode: DVC0013

Dvico Fusion HDTV Lite

Watch & record high definition digital TV on your PC. Experience premium picture quality with surround sound audio on your S-1 compatible sound system. Record in DVD quality for editing and burning to DVD. Includes IR remote control. Compatible with Microsoft MCE2005.



Now compatible with Microsoft Media Centre 2005!
Our Price \$176 **Save \$23**
WebCode: DVC0004

Dvico Fusion HDTV Plus

Watch & record HD digital TV on your PC. Exceptional picture quality with surround sound audio on your S-1 compatible sound system. Record in DVD quality for editing and burning to DVD. Pause & replay live TV with timeshifting. Capture analogue video. Includes IR remote control. Compatible with Microsoft MCE2005.



Now compatible with Microsoft Media Centre 2005!
Our Price \$219 **Save \$30**
WebCode: DVC0005

Pinnacle Moviebox
Deluxe 9 Plus

A complete video capture and editing solution for the PC. An easy-to-connect, external USB 2.0 device. MovieBox Deluxe supports both digital and analog camcorders and VCRs. Includes an external USB-2 analogue to digital video converter to capture your movies from any videotape.



Our Price \$649 **Save \$50**
WebCode: PIN0093

Pinnacle AV/DV
Deluxe 9 Plus

Pinnacle Studio AV/DV Deluxe version 9 contains Pinnacle Studio Plus, a PC video editing solution, a PCI analog and digital video capture card, and a professional quality video breakout box for easy connection of any type of camcorder. Packed with incredible video editing, restoration and DVD authoring features, Pinnacle Studio AV/DV Deluxe will help make your home movies the best they can be.



Our Price \$528 **Save \$47**
WebCode: PIN0092

Pinnacle
ShowCenter 200

The ShowCenter 200 from Pinnacle lets you easily stream your favorite high-quality digital photos, music and movies from your PC to your television and home stereo system. It combines top-notch audio and video quality, including HD photo and video support, with an intuitive user interface for an incredibly convenient and engaging entertainment experience.



Our Price \$550 **Save \$49**
WebCode: PIN0109

Microsoft Wireless Notebook Optical Mouse

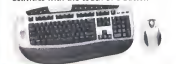
- Snap-in receiver cuts the battery when not
- Optical technology for precision and speed
- Scroll Wheel to move through documents quickly
- Designed for comfort for either hand
- Longer battery life



Blue	State
Our Price \$61 Save \$8	Our Price \$61 Save \$8
WebCode...MST8354	WebCode...MST8353

Microsoft Optical Desktop with Fingerprint Reader

- Fingerprint Reader for Convenient Password Replacement
- Optical Mouse with Tilt Wheel Technology
- Longer Mouse Battery Life
- Multimedia Centre - Control your media activities with the touch of a button



Our Price \$152 Save \$48
WebCode...MST8351

Microsoft Standard Wireless Optical Mouse

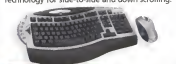
- Long Battery Life - Many users average more than six months battery life
- 3 Button mouse
- Optical Technology for speed and precision
- Designed for comfort for either hand
- USB/PS2



Black	White
Our Price \$39 Save \$10	Our Price \$39 Save \$10
WebCode...MST8342	WebCode...MST8341

Microsoft Wireless Optical Desktop Comfort Edition

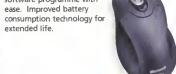
Features a new Curve Design which provides enhanced comfort in a flat keyboard. The Zoom Slider allows you to zoom in and out of images on-screen. Gain instant access to your favourite Web sites and files with the keyboard "My Favourites" Keys. The wireless optical mouse has a longer battery life, as well as Tilt Wheel Technology for side-to-side and down scrolling.



Our Price \$115 Save \$35
WebCode...MST8340

Microsoft Wireless Optical Mouse

Wireless Optical Mouse (Steel Blue) is a cut above the rest in wireless performance, comfort and style. This optical mouse is equipped with 3 buttons, a tilt wheel and a scroll wheel to guide you around any software programme with ease. Improved battery consumption technology for extended life.



Our Price \$55 Save \$15
WebCode...MST8289

Microsoft Wireless Desktop 1000

- Wireless Freedom—No cords
- Optical Technology for Precision Accuracy and Speed
- Enhanced F Keys - Perform common commands from your keyboard
- Customisable Hot Keys - Get one-touch access to the programs and files you use most



Our Price \$70 Save \$20
WebCode...MST8356

Logitech Precision PC Gaming Headset

For the gamer with attitude. Big 40mm neodymium stereo headphone drivers give you the audio experience you've been looking for, and its noise canceling microphone delivers the voice quality you demand.



Our Price \$31 Save \$19
WebCode...LOG3457

Logitech Cordless Desktop EX-110

The Cordless Desktop EX 110 makes it incredibly easy and affordable to go cordless in style. Quick, simple to set up, and completely reliable. Enjoy the freedom and precision of an 800-dpi optical mouse, plus one-touch controls that make music, Internet, and other frequent functions simpler. Superb quality and value.



Our Price \$55 Save \$33
WebCode...LOG3507

Logitech Quickcam Sphere

QuickCam Orbit is designed to turn heads. The mechanical pan and tilt feature allows the webcam to turn side and side to give you 180° field of view, and tilts up and down 60°. Face-tracking software will automatically follow you to keep you in view. It even zooms in so you can clearly see the details. It's easy to add live video to all your IM sessions.



Our Price \$181 Save \$69
WebCode...LOG3494

SanDisk Cruzer Micro

SanDisk Cruzer Micro is a small USB Flash Drive that connects to a computer's USB port. Users can easily store their key documents, pictures, music and videoclips on a Cruzer Micro and transfer them to another computer with a USB port.

Cruzer Micro

512MB (SIN0688) \$75
1GB (SIN0436) \$143
2GB (SIN0434) \$286

Mini Cruzer

256MB (SIN0381) \$49
512MB (SIN0386) \$75
1GB (SIN0391) \$136

256MB
Our Price \$45 Save \$19
WebCode...SIN0121

SanDisk 256MB Digital Audio Player

The new Digital Audio Players combine crystal-clear sound with a sleek design and sport a three-button-one-joystick design and easy-to-navigate user interface. They feature MP3, Windows Media® file and Windows Media-based DRM file playback, FM radio and voice recording. Doubles as a USB data storage device.

Blue 512MB (SIN0150) \$189
Silver 1GB (SIN0157) \$249

Our Price \$129 Save \$20
WebCode...SIN0159

SanDisk Titanium 512MB

The 512MB Cruzer Titanium is designed to meet the needs of business and power users who place a premium on high durability and fast data transfers. SanDisk Cruzer Titanium is perfect for storing and transporting documents, pictures, presentations and music - anytime, anywhere, and under any conditions.

1GB (SIN0151) \$176
2GB (SIN0150) \$363



Our Price \$99 Save \$47
WebCode...SIN0399

SanDisk ImageMate 5-in-1 Card Reader/Writer

Transfer all your pictures with the touch of a button! SanDisk offers super-fast single slot card readers for a variety of popular flash memory cards. Available for all standard card formats.

Compact Flash Reader/Writer (SAN0016) \$30

ImageMate 12-in-1 Reader/Writer (SIN0160) \$55



Our Price \$30 Save \$5
WebCode...SAN0015

SanDisk Sansa 1GB MP3 Player

High quality digital music playback with easy navigation and expandable memory at an affordable price. You can add up to 2GB of additional storage space with the SD slot. It also includes an FM tuner and superior sound with SRS WOW and high-quality in-ear headphones.



Our Price \$299 Save \$50
WebCode...SAN0018

SanDisk Photo Album with Remote

The SanDisk Photo Album now makes it simple, convenient and affordable to view, store and share your favorite digital photos, video clips and music on your TV. No computer is required! Family and friends no longer have to crowd around a computer or your camera's LCD screen to view photos.

Stores Images permanently on Compact Flash - ask about our range of CF cards!



Our Price \$88 Save \$8
WebCode...VME0005

COMSOL

Comsol
ServerLink Star
2 Port KVM

Control two PCs with a single keyboard, monitor & mouse. All ServerLink Star KVM switches have audio and microphone support for multimedia applications.

SL-271-P (COM0075) \$77

SL-271-U (COM0076) \$88



SL-271-C
Our Price **\$79** Save **\$6**
WebCode COM0077

Comsol
ServerLink Slim
Desktop KVM

ServerLink Slim Desktop KVM The ServerLink Slim Desktop KVM Switch is designed to let you control two or four PS/2 style computers using one keyboard, monitor and mouse. With its slim size and ease of operation, it is an indispensable device for managing multiple PCs on your SOHO or Corporate desktop. Its compact and lightweight design fits comfortably anywhere on your desktop.

SL-281-P (COM0094) \$105



Cables included

4 Port
Our Price **\$175** Save **\$24**
WebCode COM0095

Comsol VGA
Monitor Splitters

Simultaneously broadcast one VGA signal up to 8 different monitors can never be easier with Comsol's high-end video splitters. Comsol once again pushes the bandwidth to 350MHz for crisp clear video quality. Available with two, four and eight ports.

4 Port (COM9145) \$195

8 Port (COM9150) \$255



2 Port
Our Price **\$107** Save **\$18**
WebCode COM9140

Comsol USB VoIP Phone

This fully-featured USB VoIP Phone allows you to talk to friends or colleagues just like a normal telephone. Used in conjunction with Skype or similar software, it offers you a complete free Internet telephony solution. The UVP-001 features simple plug-and-play installation, integrated LCD and keypad, echo cancellation and noise reduction.

- Talk to friends or colleagues just like a normal phone
- Provides a complete free Internet telephony solution
- SKYPE ready - talk for free with other Skype users
- Works with most leading VoIP providers
- Independent use of phone and sound card allows for VoIP call whilst listening to music
- Make huge savings on local, STD and international calls
- Ideal for the mobile traveller
- Easy to install USB plug-and-play technology
- Allows PC-to-PC and PC-to-phone operation
- LCD display, keypad and ring
- 10 programmable ring tones for incoming calls
- Echo cancellation and noise reduction
- Caller ID function of VoIP calls



Our Price **\$70** Save **\$19**
WebCode COM0101

Comsol USB 2.0 flashIT2 Flash Drives

These pocket USB 2.0 flashIT2 Storage Drives plug directly into any standard USB port and are compatible with both PC and Macs. They also feature password security control to prevent unauthorised access.

- Hi-Speed USB 2.0 Certified
- Password Security control
- True Plug and Play

128MB (COM0111) \$35

512MB (COM0107) \$93

1GB (COM0108) \$165

2GB (COM0109) \$342



256MB
Our Price **\$57** Save **\$8**
WebCode COM0106

Comsol SD Card Reader plus
MP3 Player

The SD-MP3 is a combined Hi-Speed USB 2.0 SD card reader and MP3 player. Just plug the SD-MP3 into the USB port of your PC or Mac, insert your SD storage card and transfer all your digital files by user friendly drag-and-drop. The built-in MP3 player allows you to listen to your favourite MP3 files, straight from your storage card, while on the move. The SD-MP3 comes complete with stereo earphones so now you can carry your digital files and music everywhere you go.

Storage card not included.



Our Price **\$44** Save **\$15**
WebCode COM0103

Comsol USB Bluetooth Adapter

A quick and easy solution for users wanting to add Bluetooth capability to their computer. It plugs directly into your USB port and enables wireless connectivity with Bluetooth devices including mobile phones PDAs printers and other computers.

- Bluetooth v1.2 certified
- WIDCOMM "Bluetooth for Windows" connectivity software
- Full-Speed Class 2 Bluetooth operation
- Ideal for mobile phones, PDAs, headsets, printers etc.
- Operation range up to 40m



Our Price **\$57** Save **\$12**
WebCode COM0104

Comsol USB 2.0 Card Reader 17 in 1

Exchanging data between your computer and Digital Camera, MP3, PDA etc. has never been so fast and convenient. Supporting almost all of the available storage cards including: SD, Mini SD, SD Ultra II, MMC 1, MMC 2, RSMMC, MicroDrive, CF I, CF II, CF-Ultra II, CF-Extreme, MS, MS Pro, MS Pro Duo, MS Pro (MG), MS Pro Duo (MG), TransFlash.

- Hi-Speed USB 2.0 Certified
- Transfer files by user friendly drag-and-drop
- Data can be exchanged between sockets
- Transfer speeds up to 480Mbps

Black (COM0502) \$35



Our Price **\$35** Save **\$14**
WebCode COM0102

Comsol 4 Port USB 2.0 Mini Hub

The UMH-402 Hi-Speed Mini Hub allows you to add 4 high-performance USB 2.0 peripherals to your notebook or portable computer. Designed for low powered devices, its ultra compact design makes it the perfect portable solution to extend your notebook's high-speed USB connectivity.

- Hi-Speed USB 2.0 Certified
- Ultra compact for portability
- Ideal for mobile notebook users
- Transfer speeds up to 480Mbps



Our Price **\$30** Save **\$5**
WebCode COM0105

Comsol USB 2.0 QuickLink Cable 5-in-1

The Comsol USB 2.0 5-in-1 QuickLink Cable ensures you will always have the right connection. Designed for the mobile traveller, the QuickLink cable provides you with 5 different USB cable configurations for all your USB peripherals.

- Detachable Connectors for added convenience
- Foil and Braid Shielding to reduce EMI/RFI interference
- Includes connector carry case for convenient storage



Our Price **\$28** Save **\$2**
WebCode COM0072

CAN THE DEAL GET BETTER?

Call 1300 658 600 or visit: www.comsol.com.au as prices may change due to the daily fluctuations and online discounts. Save price is calculated off the RRP.

1300 658 600

CITY
SOFTWARE

Belkin SurgeMaster

A power surge or lightning strike can destroy your electronic equipment in an instant. The SurgeMaster range offers the best protection for all your sensitive electronic devices in your home or office. No amount of thunder and lightning will ever be able to scare away your protection. Be safe and smart; choose a SurgeMaster with telephone/data line protection and if you want to protect your AV equipment with coaxial connection, choose the surge protector that protects both.

WebCode Product Description

WebCode	Product Description	Price	SAVE
BEL0244	Belkin Home Series Surge Cube	\$27	\$3
BEL0245	Belkin Home Series Surge Cube with Tel	\$35	\$5
BEL0247	Belkin Home Series 4-Way (2m Cord)	\$49	\$10
BEL0248	Belkin Home Series 4-Way (2m Cord) plus AV	\$66	\$13
BEL0250	Belkin Superior Series 6-Way (2m Cord) plus Tel	\$99	\$30
BEL0251	Belkin Superior Series 6-Way (2m Cord) plus Tel plus AV	\$115	\$34
BEL0253	Belkin Gold Series 7-Way (3m Cord) plus Tel plus AV plus RJ45	\$149	\$50
BEL0255	Belkin Gold Series 8-Way (2m Cord) plus Tel	\$129	\$30
BEL0256	Belkin Gold Series 8-Way (2m Cord) plus Tel plus AV	\$145	\$34



HP Home Cinema Projector

- DLP technology
- Professional home cinema
- Flexible installation
- 840 ANSI lumens
- Native Resolution SVGA 800 x 600
- Scales up from VGA 640 x 480
- Scales down from XGA 1024 x 768
- Contrast ratio 1600:1
- Weight 5.7kg



Our Price **\$2260** Save **\$468**
WebCode... HPP1577

Belkin Wireless Rechargeable Mouse

The Rechargeable Wireless Optical Mouse from Belkin provides advanced wireless mouse functionality along with the convenience of recharging from the base. Designed for comfortable right or left handed use.



Rechargeable

Our Price **\$60** Save **\$10**
WebCode... BEL9997

Belkin Hi-Speed USB 2.0 7-Port Hub

Belkin's Hi-Speed USB 2.0 7-Port Hub features two top-loading downstream USB ports. Now you can enjoy fast access for temporary device connections such as USB thumb drives, media readers and for USB lights, fans and other accessories. Monitoring your device activity is simpler than ever with LEDs for master power status and all port activity.



Our Price **\$64** Save **\$15**
WebCode... BEL0263

Belkin Wireless Keyboard & Optical Mouse

Uses digital radio technology to give you the luxury of using your keyboard and mouse anywhere within six feet of the receiver. No more cables to clutter your desktop. The mouse uses optical technology to deliver accurate signals from smooth, easy movements. Access the Internet and favorite applications using the seven multimedia keys and seven hot keys.



Our Price **\$55** Save **\$5**
WebCode... BEL0163

Purchase \$150 worth of Belkin iPod accessories^ and receive \$25 CASHBACK!

*Not valid on Auto Power Kit (F8V7058-APL) or TuneCast II (F8V3060-APL). Valid between 1/6/05 and 31/8/05. Visit www.belkin.com/anz for more details.

Belkin TuneBase FM for iPod Mini

TuneBase FM offers an elegant way to use your iPod mini on the road. While mounted, your iPod mini charges and wirelessly plays audio through your FM radio. It works from any cigarette-lighter outlet.



Built In FM Transmitter

Our Price **\$122** Save **\$8**
WebCode... BEL0405

Belkin TunePower

The TunePower Rechargeable Battery Pack from Belkin keeps the music playing by letting you power your iPod-even when your internal battery is drained.

Works with all iPods with dock connectors; includes 3 sleeves for 10/15/20GB iPod, 30/40GB iPod, and iPod mini. Provides additional 8-10hrs battery life and includes firewire charging cable.



Our Price **\$1427** Save **\$28**
WebCode... BEL2908

Belkin iPod Mini Silicon Rubber Sleeves 3 Pk

The Belkin silicon sleeves provide a great way to preserve your iPod. This value pack comes with 3 colours and a lanyard carnytrap. Available for iPod mini (shown), iPod Shuffle and 4g iPods.

F8Z025-3 iPod Shuffle Silicon Rubber Sleeves (3pk)
Pink, Blue, Frost
(BEL9995) \$30



F8Z021-3 4G iPod Silicon Rubber Sleeves (3pk)
Pink, Blue, Frost
(BEL9998) \$30

Our Price **\$30** Save **\$10**
WebCode... BEL9996

Belkin Complete Mobility Bundle

Belkin's Complete Mobility Bundle is designed to meet the needs of all mobile professionals. It represents a necessary addition to any notebook solution and includes the Belkin NE MC Notebook bag, minicollimator and 4 port hub all in the one pack at a value price.



Our Price **\$65** Save **\$24**
WebCode... BEL2489

Belkin USB Mobile Numeric Keypad

The Numeric Keypad from Belkin uses USB Plug-and-Play technology to offer notebook users the instant benefit of a 19-key, external, numeric keypad in a compact format optimal for the mobile professional.



Our Price **\$35** Save **\$5**
WebCode... BEL0365

Belkin Mini USB Glo Mouse with Retractable Cord

The MiniGlo Optical Mouse from Belkin provides a fun and compact input solution for the mobile user. It features attractive color-changing lights that glow brightly, day or night. Take it on the road easily and use it with optical precision on virtually any surface anywhere you use your USB laptop.



Our Price **\$28** Save **\$11**
WebCode... BEL2826

Sony 6.1 Channel Home Cinema in a Box

- Power Output: 120W x 6
- Dolby Pro Logic/ Pro Logic II / Dolby Digital EX / DTS ES, DTS Neo6 decoding
- Multi brand Pre programmed remote control for controlling other components
- Front/rear satellite speakers
- Centre satellite speaker
- Active subwoofer



Our Price **\$1099** Save **\$100**
WebCode... SHY0425

Thermaltake Big Typhoon

Compatible with Intel P4/LGA 775 & AMD K7/K8. 6 Heatpipes allow quick transfer of heat. Copper base & High density aluminum fins provide more surface area for good heat dissipation



Our Price **\$70** Save **\$4**
WebCode... TTK0010

Thermaltake Liquid BigWater Liquid Cooling System

Universal 4 in 1 solution, compatible with Intel P4 socket 775, AMD K8, AMD K7. High performance radiator with VR fan. All copper waterblock with blue LED acrylic cover & universal clips. Powerful DC 12V water pump. Transparent green pipes to light up your case. High performance coolant to steady water quality & reduce anti-freezing and anti-rusting.



Our Price **\$185** Save **\$20**
WebCode... ANY0174

i-Rocks USB Keypad plus 2 Port Hub

Compact and stylish USB numeric keypad. An ideal accessory for accountants, auditors or if you are tired of your cramped notebook keyboard. White, crystal like finish with a bonus integrated 2 port USB hub to attach a keyboard and mouse. Lightweight for easy storage and portability in your notebook bag.



Our Price **\$32** Save **\$8**
WebCode... IRS0014

Thermaltake Super Tower Aluminium Armor Case

Supplied with new 430W Thermaltake power supply. Includes dual 12cm blue LED fans in front. Stylish aluminium front bezel. 7 expansion slots. Removable HDD cage. Tool-free installation for 5.25" devices. Relocatable front control panel (Power switch, Reset switch, HDD & Power LEDs). Screwless slots for easy assembly. 3 x 3.5" HDD Module with 12cm fan.



Black
Our Price **\$299** Save **\$40**
WebCode... TTK0011

Plantronics Stereo PC Headset

Behind the Head Stereo PC Headset with Microphone. Listen to CDs, DVDs or MP3 music in awesome full range stereo sound. Equipped with convenient inline volume and mute controls and a quickadjust microphone boom that ensures correct placement for speech applications. Lightweight headset with superior speech recognition microphone.



Our Price **\$49** Save **\$10**
WebCode... ANY0039

Thermaltake Mid Tower Soprano Case

Includes 400W Thermaltake power supply. High efficiency ventilation: Dual 12cm silent fan in front & rear, 9cm fan on side panel. Tool-Free when installing 5.25" & 3.5" devices. Dual USB 2.0, IEEE 1394 Firewire, Audio & Speaker ports. Retractable foot stand.



Silver
Our Price **\$176** Save **\$33**
WebCode... TTK0005

Plantronics USB Stereo PC Headset

Plantronics All-Purpose USB Stereo PC Headset with Microphone. Ultra-light weight, comfortable design. Perfect for all your multimedia needs. Listen to CDs, DVDs, or MP3s with digitally enhanced stereo sound. USB plug and play.



Our Price **\$85** Save **\$14**
WebCode... ANY0109

Thermaltake Super Tower Aluminium Kandalf Case

Supplied with new 430W Thermaltake power supply. Aluminium front bezel. 7 expansion slots. Removable HDD cage. Tool-free installation for 5.25" devices. Relocatable front control panel (Power switch, Reset switch, HDD & Power LEDs). Screwless slots for easy assembly. 3 x 3.5" HDD Module with 12cm fan. Accessory box bundled in 5.25" drive bay. Retractable foot stand.



Black
Our Price **\$349** Save **\$50**
WebCode... TTK0012

Plantronics Bluetooth Headset

Perfect for the mobile professional. Wireless freedom and unparalleled versatility in the office and on the go. Simplify your communications with this extremely lightweight and versatile headset. Enjoy all-day wearing comfort, clear voice transmission and superior sound quality without wires! With the optional Desktop Adapter, your headset can be used in the office or on the go.



Our Price **\$105** Save **\$44**
WebCode... ANY0188

i-Rocks Minlop USB Mouse

A necessary notebook companion for every business traveller. Stylish design with precise accuracy of 800dpi resolution. Optical technology for functionality on many surfaces. Other features include Retractable cable for easy storage, adaptor for PS/2 or USB connection.



Black (IRS0008) **\$19**
Red (IRS0010) **\$19**
Silver (IRS0011) **\$19**

Blue
Our Price **\$19** Save **\$10**
WebCode... IRS0009

i-Rocks MP3 CAR DJ FM Transmitter

By plugging in your USB flash drive or mp3 player (or any audio source with an audio output like your PDA or CD player) into the mp3 DJ and then tuning to the specified FM channel, you can immediately enjoy listening to your favourite digital music over your car stereo.



Our Price **\$65** Save **\$15**
WebCode... IRS0020

i-Rocks Aluminium USB 2.0 12-in-1 Card Reader

i-Rocks Aluminium USB 2.0 12-in-1 Card Reader with Blue LED - Silver. Supports CF I / CF II, Smart Media, MMC I / MMC II, SD*, IBM Micro Drive, MStick, MStick Pro, MStick Duo*, MStick Pro Duo*, Mini SD*.



Red
Our Price **\$35** Save **\$10**
WebCode... IRS0013

i-Rocks Hub/Reader Combo

Combination 3 Port USB 2.0 Hub plus Memory Card Reader. Compact design for easy storage. Reads most memory card types and true plug and play! Swappable for easy use and store away. Fast transfer rates with USB 2.0 of 480Mbps. Supplied with Carry bag.

Black (IRS0015) **\$60**
Red (IRS0017) **\$60**
Silver (IRS0018) **\$60**



Blue
Our Price **\$60** Save **\$10**
WebCode... IRS0016

i-Rocks Brushed Aluminium 4 Port USB 2.0 Hub

i-Rocks Brushed Aluminium 4 Port USB 2.0 Hub with Blue LED. Includes power adapter. Small & compact. High speed transfer rate up to 480Mbps for each port - Silver.



Aluminium
Our Price **\$32** Save **\$7**
WebCode... IRS0005

i-Rocks 2.5" USB2.0 Aluminium HDD Enclosure

i-Rocks 2.5" USB2.0 HDD Enclosure with aluminium alloy housing. Delivers 480 Mbps data transfer rate USB to IDE & 800Mbps IEEE1394b to IDE. Includes power/access status LED indicator. Easy installation with screwless design.



Our Price **\$33** Save **\$17**
WebCode... IRS0019

Sitecom NitroXM 140g+ Wireless Broadband Router

Transmission and Receiving station for wireless network up to 64 wireless Notebooks and PCs can connect. Can be used to share an Internet connection via wireless. Includes an inbuilt 4 port 10/100 switch, connect extra PCs via network cables. Uses Sitecom NitroXM 140g+ wireless standard when used with other Sitecom 140g+ products speeds of 45Mbps or higher can be achieved

Our Price **\$140** Save **\$29**
WebCode ANY0184

Sitecom NitroXM 140g+ Wireless USB Adapter

Allows you to connect your Notebook or Desktop PC to a Wireless Network via USB 2.0. Quick & Easy Installation Share Photos, Music and Data wirelessly. Uses Sitecom Nitro XM 140g+ wireless standard.

Our Price **\$73** Save **\$16**
WebCode ANY0185

Sitecom NitroXM 140g+ Wireless PCI Card

Allows you to connect your Desktop PC to a Wireless Network. Share Photos, Music and Data wirelessly. Uses Sitecom Nitro XM 140g+ wireless standard.

Our Price **\$60** Save **\$19**
WebCode ANY0186

Sitecom NitroXM 140g+ Wireless Cardbus Card

Allows you to connect your notebook to a Wireless Network. Share Photos, Music and Data wirelessly. Uses Sitecom Nitro XM 140g+ wireless standard.

Our Price **\$60** Save **\$19**
WebCode ANY0187

Sitecom USB 3.5" Floppy Drive

The Sitecom USB 3.5" Floppy Drive can be used on Windows 98SE or higher and Mac OS 8.6 and Mac OS 9.x and higher. The USB Floppy Drive can read, write and format 3.5" disks.

Our Price **\$73** Save **\$12**
WebCode ANY0182

Sitecom USB 2.0 to VGA Adaptor

Easily connect an extra monitor to any computer with a USB port. Even if you are using a notebook, the USB 2.0 to VGA adaptor enables you to enjoy the convenience of an extra monitor via USB at any location.

Our Price **\$119** Save **\$40**
WebCode ANY0088

Sitecom Wireless Media Player

Wirelessly transfer from all WiFi PCs's music and pictures and play them on your TV, home cinema set or stereo. Includes 5.1 audio and Dolby Digital. Compatible formats: DivX, MP3, MPEG4 & WMA. Includes wireless remote control.

Our Price **\$297** Save **\$52**
WebCode SIT0003

Sitecom Bluetooth USB Adapter

Class 2 10m. With the Bluetooth USB Adapter you experience freedom in the widest sense! For you have in hand an extremely ingenious tool enabling you to exchange data through your mobile Bluetooth telephone or to exchange data between various PCs or notebooks with a Bluetooth USB adapter.

Our Price **\$44** Save **\$15**
WebCode ANY0183

Aten 2 Port KVM Switch

Utilize only 1 set of Keyboard, Monitor & Mouse to access multiple PCs or Servers. Ideal for technical workbenches for testing PCs, training on multiple OS or for multiple server admin and maintenance. CS-82/84A desktop versions. PS/2 and VGA connections, cables supplied.

Aten 4 Port KVM Switch (ANY0135) **\$77**
Aten 8 Port KVM Switch- Rackmountable (ANY0136) **\$490**

Our Price **\$115** Save **\$5**
WebCode ANY0134

Aten 2 Port Video Splitter 250MHz

Ideal solution for training or presentation scenarios where you need to display what's on your monitor onto a Projector or another monitor. Supports XGA, SVGA, VGA and multivision monitors.

4 Port Video Splitter 250MHz (ANY0138) **\$77**
8 Port Video Splitter 200MHz (ANY0139) **\$99**

Our Price **\$55** Save **\$14**
WebCode ANY0137

Aten 2 Port Peripheral Sharer Switch

Ideal for Small Office or Home Office with no existing network infrastructure, or for peripherals like printers that are not networkable. Share a single USB peripheral (printer/scanner) with either 2 or 4 computers. Sharing is exclusive to computer i.e. one-at-a-time basis.

Aten 4 Port Peripheral Sharer Switch (ANY0143) **\$60**

Our Price **\$45** Save **\$5**
WebCode ANY0142

Compro VideoMate Hybrid Analog TV/Video & Digital TV Card

The First TV Tuner on the market that does both digital & analog.

- Full PC Power On/Off via remote.
- Full PC Power On/Off for scheduled recording.
- Low profile form factor.
- Windows Media Centre compatible.
- Picture Purifying technology for sharper pictures.
- Recommended by PC Authority-May 2005

Our Price **\$149** Save **\$50**
WebCode ANY0180

AL Tech MediaGate 3.5" Hard Disk Media Player

This portable media player allows DivX, MPEG4, DAT, Xvid, MP3, OGG, WMA and JPEG play back. It sounds great with its Dolby Digital capabilities and it's easy to search through all your music, movies and pics with the user friendly remote control. Using a 3.5" hard disk (not included), the MediaGate MGS3 can store hundreds of movies, music files or images ready for viewing via your TV. With networking capabilities, this handy unit allows direct retrieval of files from your PC. Home entertainment has never been easier.

Our Price **\$250** Save **\$49**
WebCode ALT2001

Our Price **\$52** Save **\$23**
WebCode ANY0181

Maxtor SATA Hard Drives

- Designed for mainstream PC, consumer electronics and emerging markets
 - 80, 120, 250 & 300GB capacities
 - 7200 RPM
 - SATA interfaces
 - 2MB or 8MB cache buffer
 - Fluid dynamic bearing motors for quiet operation
- 120GB (MAX0066) **\$154**
 250GB (MAX0056) **\$319**
 300GB (MAX0061) **\$374**



80GB
Our Price \$110 **Save \$19**
 WebCode MAX0054

Maxtor Hard Drives ATA-133 7200RPM 8MB Cache

The solution for performance PCs with data intensive applications such as network attached storage, home networking devices, audio, video and other multimedia applications.

120GB (MAX0052) **\$125**
 160GB (MAX0053) **\$140**



80GB
Our Price \$99 **Save \$10**
 WebCode MAX0051

Maxtor 80GB USB Hard Drive

Easy add-on storage for home or office. Instantly expand your storage to hold digital photos, music, and data files. It's simple to install—just plug the external drive into an available USB port on your PC. Stores over 61,000 brilliant digital photos (JPEG normal) or 1,300 hours of digital music (MP3).



Our Price \$145 **Save \$4**
 WebCode MAX0068

Maxtor OneTouch II - Push button backup External HDD

We know it's not just data, it's your life. Save it. Store it. Back it up with a Maxtor drive. Choose a new Maxtor OneTouch II drive if you need easy backup and lots of space to hold your movies, photos and graphics. Just push the button and all your files are backed up in one simple step. Or select a Maxtor Personal Storage 3000 or 3100 drive if you need easy add-on capacity to hold your growing files.

The Maxtor OneTouch II—simple backup and storage with Maxtor DriveLock to protect the contents of your drive if lost or stolen.

Maxtor pioneered the revolutionary "pushbutton" approach to data backup, and stays in the forefront with the new Maxtor OneTouch II external hard drive. With 300GB, there's ample room to store your videos, photos, graphics, music, and more in one convenient location! The drive features a simple Maxtor user-interface for drive management, security, and backup, a whisper-quiet 7200 RPM hard drive with 16MB cache and is equipped with both FireWire and USB 2.0 interfaces for easy connection.

Includes:

- External hard drive
- USB cable
- 6 to 6 pin FireWire/1394a LINK cable
- External AC power adapter
- Vertical stand
- Installation software CD
- Dantz® Restorespect® Express HD
- Maxtor OneTouch drives
- Maxtor OneTouch utilities
- User's guide
- Maxtor limited warranty

Ideal storage for photos, music, editing video and creating high-end graphics



100GB
Our Price \$220 **Save \$9**
 WebCode MAX0069

200GB
Our Price \$330 **Save \$19**
 WebCode MAX0067

250GB
Our Price \$385 **Save \$14**
 WebCode MAX0065

300GB
Our Price \$435 **Save \$14**
 WebCode MAX0062

Maxtor Shared Storage Drive

Simple shared storage for your small office or home network. Automatic network configuration makes installation a breeze. The Shared Storage Drive looks like a local drive on each configured PC on your network. Privacy is easy with a web browser interface for making shared folders either full or limited access.

Organization is made simple with an exclusive Drag and Sort feature for dragging files such as music, photos, video, and data from your configured PC to the Shared Storage Drive for automatic sorting into appropriate folders. Two USB ports are included for connecting and sharing printers and additional hard drives.

- Add storage and share files, photos, and music with PCs on your network
- 2 USB ports for connecting and sharing printers and additional hard drives
- Access files from any networked PC
- Looks like a local drive on each configured PC
- Shared folders can be either full access (public) or limited access (private)
- Easy to use web browser interface to create privacy levels for shared folders
- Exclusive Drag and Sort feature for easy organization
- 200GB and 300GB capacities
- Automatic network configuration
- 10/100 Ethernet RJ-45 port connection
- For Windows 98SE, Me, 2000, XP computers on your network

Shared storage for small office and home network



200GB
Our Price \$445 **Save \$4**
 WebCode MAX0070

300GB
Our Price \$498 **Save \$31**
 WebCode MAX0071

Imation CD & DVD Media

Imation CD-R, CD-RW and DVD media have a high-quality dye layer that ensures lower failure rates. Each disc is tested to meet Imation's exacting standards to protect against the toughest environmental conditions.

WebCode	Product Description	Price	SAVE
IMA0024	Imation CD-R 52x 700MB/80Min 10 + 2 Bonus Disks	\$7.50	\$3
MMM0997	Imation CD-R 52x 700MB/80Min 25 Pack Spindle	\$14	\$5
MMM4628	Imation CD-R 52x 700MB/80Min 50 Pack Spindle	\$26	\$4
IMA0025	Imation CD-RW 4x 700MB/80Min 10 + 2 Bonus Disks	\$15	\$4
MMM0803	Imation CD-RW 10x 24x 700MB/80Min Ultra Speed 25 Pack Spindle	\$37	\$15
IMA0026	Imation DVD-R 8x 4.7GB 10 + 2 Bonus Disks	\$13	\$3
IMA0027	Imation DVD+R 8x 4.7GB 10 + 2 Bonus Disks	\$13	\$3
MMM0804	Imation DVD+R 4x 25 Pack Spindle	\$25	\$6
IMA0014	Imation DVD+R 2.4x 8.5GB Double Layer 1 Pack	\$9	\$2
IMA0014	Imation CD/DVD Coloured Jewel Cases 50 Pack	\$15	\$2

Imation Printable CD + DVD Media

Expand your labeling options by using a CD/DVD printer or duplication service to print directly onto Imation printable discs. The premium print quality of Imation printable media offers a professional, consistent look and feel to your CD creations.

WebCode	Product Description	Price	SAVE
IMA0022	Imation CD-R 52x 700MB/80Min 10x Slim Case White Inkjet Printable	\$9	\$2
MMM0413	Imation CD-R 52x 700MB/80Min 50x Spindle White Inkjet Printable	\$25	\$10
MMM2958	Imation CD-R 52x 700MB/80Min 50x Spindle Gold Thermal Printable	\$25	\$10
MMM5327	Imation DVD-R 8x 4.7GB 10x Slim Case White Inkjet Hub Printable	\$15	\$2
MMM6355	Imation DVD-R 8x 4.7GB 50x Spindle White Inkjet Hub Printable	\$45	\$13
MMM6353	Imation DVD+R 8x 4.7GB 50x Spindle White Inkjet Hub Printable	\$45	\$13

Imation USB 2.0 Swivel Flash Drive & Flash Drive Mini

The Imation USB 2.0 Flash Drives are compact and powerful flash drives. Featuring a unique "never lose the cap" swivel design to give you the sophisticated, professional look you seek from your personal technology. Weighing only 30 grams, the drives fit easily around your neck, in your pocket or briefcase giving you convenient access to your drive, anytime, anywhere you are. The Swivel drive features lightning fast USB 2.0 drive speed, data can be read up to 8MB/second and written up to 7MB/second. The Mini Flash Drive can read data up to 6MB/second and write data up to 1MB/second - saving you valuable time when transferring, sharing or storing your critical data.

WebCode	Product Description	Price	SAVE
MMM5886	Imation 128MB USB 2.0 Flash Drive Swivel	\$42	\$11
MMM5887	Imation 256MB USB 2.0 Flash Drive Swivel	\$66	\$23
MMM5888	Imation 512MB USB 2.0 Flash Drive Swivel	\$103	\$36
MMM5559	Imation 1GB USB 2.0 Flash Drive Swivel	\$171	\$58
MMM3694	Imation 2GB USB 2.0 Flash Drive Swivel	\$332	\$117
MMM6978	Imation 128MB USB 2.0 Flash Drive Mini	\$34	\$9
MMM6986	Imation 256MB USB 2.0 Flash Drive Mini	\$55	\$14
MMM6994	Imation 512MB USB 2.0 Flash Drive Mini	\$91	\$24
MMM7063	Imation 1GB USB 2.0 Flash Drive Mini	\$157	\$52

Imation CD-RW and DVD Drives

Whether you choose CD or DVD to backup, Imation has the Optical Drive to suit your needs! Now you can create your own digital masterpieces and share them with ease. All drive kits come complete with everything you need to get started, including the latest software.

WebCode	Product Description	Price	SAVE
MMM0060	Imation CD-RW Drive Internal 52x32x52	\$55	\$14
MMM0030	Imation DVD Dual Layer 16x16x8x6x4 Internal Drive	\$125	\$24
MMW1869	Imation DVD Dual Layer 16x16x8x6x4 External Drive	\$175	\$54

Imation 4mm, DLT, LTO & SDLT Tape Cartridges

WebCode	Product Description	Price	SAVE
MMM3441	Imation Data Tape 4mm 125m DDS-3	\$11	\$2
MMM3804	Imation Data Tape 4mm 150m DDS-4	\$15	\$5
MMM3430	Imation Data Tape DLT IV 2080GB (drive dependent)	\$37	\$31
IMA0105	Imation Data Tape Super DLT 160/320GB (drive dependent)	\$60	\$46
MMM3438	Imation Data Tape LTO Ultrium 100/200GB (drive dependent)	\$43	\$31
IMA1240	Imation LTO Ultrium Gen 2 200/400GB Cartridge	\$62	\$46
MMM4585	Imation LTO Ultrium Gen 3 400/800GB Cartridge	\$165	\$95

Pioneer 16x DVD+/- Dual Layer DVD Burner (Beige)

This model supports 16x write speeds on both DVD-R/+R along with the capability to write at 6x speed on DVD-R/+R Double/Dual Layer media.

Includes Nero LE



Our Price \$115

WebCode P100042

Imation® REV™ USB Drive

Read and write to the Imation REV™ 35GB/90GB disks, which are pocket-sized, cartridges that hold 35GB of data (or up to 90GB of backup data with the included software compression).

Atapi (IOM2963) \$515

Firewire (IOM3063) \$547

SCSI (IOM3078) \$683



Our Price \$546

SAVE \$153

WebCode JOM2955

LaCie DVD±RW Internal Drive with Lightscribe

Create interactive video DVDs, store files and digital photos on your computer. New Lightscribe - technology burns slickscreen quality custom labels directly onto your disks with the very same laser that burns data.

External USB (LAC7830)

\$239

External Firewire (LAC7840)

\$258



Our Price \$175

SAVE \$20

WebCode LAC0949



Imation CD-R 52x 700MB/80Min 10 Pack Slim Case White Inkjet Printable



Imation USB 2.0 Flash Drive Swivel & Flash Drive Mini



Imation DVD Dual Layer 16x16x8x6x4 Internal Drive



Imation Data Tape Super DLT 160/320GB



XP Sound

The "XP201" Phono/Mic pre-amp provides a combination of hard and software to achieve high quality transfer of old records and cassettes to your home desktop PC or laptop in addition to offering a handy high quality microphone pre-amp and headphone amplifier. The included software (Win only) "Diamond Cut 32 V4.0" allows users to professionally edit their recorded audio.



Our Price **\$176** Save **\$23**
WebCode: XPS0001

Hot Drive 5.25" External Case

- Suitable for IDE CD-ROM, CDRW, DVDROM, DVD/R
- RW & 3.5" Hard Drives
- Cooling Fan For Excellent Heat Dissipation
- Easy to Install
- USB 2.0 up to 480Mbps Transfer Rate
- Firewire up to 400Mbps Transfer Rate
- Supports Win 98SE/ ME/2000/XP & Mac OS 9.0 or later.



Our Price **\$90** Save **\$39**
WebCode: HOT0005

Sennheiser HD212PRO

Closed Stereo Monitoring Headphone

The HD 212 Pro closed dynamic hi-fi stereo headphones have a balanced sound image with a slight emphasis on the bass response. Dis like their excellent attenuation of ambient noise and the soft, comfortable ear pads.



Our Price **\$110** Save **\$20**
WebCode: SHN0006



HP DeskJet Cartridges

WebCode	Product Description	Price	SAVE
HPD2061	HP Ink Cartridge No 27/28 Combo	Twin Pack \$45	\$5
HPD2017	HP Ink Cartridge No 56/57 Combo	Twin Pack \$61	\$15
HPD2025	HP Ink Cartridge No 56 Black for DJ 5550 - C6656AA	Twin Pack \$45	\$5
HPD4844	HP Ink Cartridge No 10 Black for DJ 2000C/2500C - C4844AA	\$44	\$17
HPG4836	HP Ink Cartridge No 11 Cyan for DJ 500/800 - C4836AA	\$45	\$10
HPG4837	HP Ink Cartridge No 11 Magenta for DJ 500/800 - C4837AA	\$45	\$10
HPG4838	HP Ink Cartridge No 11 Yellow for DJ 500/800 - C4838AA	\$45	\$10
HPD5002	HP Ink Cartridge No 14 Black - C5011DA	\$34	\$10
HPD5001	HP Ink Cartridge No 14 Colour - C5010DA	\$45	\$12
HPD6645	HP Ink Cartridge No 15 Black for DJ 810C/812C/840C/845C - C6615DA	\$39	\$11
HPD6652	HP Ink Cartridge No 17 Colour for DJ 840/845 - C6625AA	\$42	\$14
HPD6654	HP Ink Cartridge No 20 Black for DJ 610C/630C/640C - C6614DA	\$39	\$15
HP11826	HP Ink Cartridge No 23 Colour for DJ 720C/880C/890C - C1823DA	\$45	\$13
HPD9030	HP Ink Cartridge No 26 Black for DJ 400/420/500 - C1626AA	\$41	\$15
HPD8772	HP Ink Cartridge No 27 Black for DJ 3420 - C8772AA	\$26	\$7
HPD8782	HP Ink Cartridge No 28 Colour for DJ 3420 - C8782AA	\$30	\$8
HPD9050	HP Ink Cartridge No 29 Black for DJ 600/610/630C - C1629AA	\$41	\$3
HPD905	HP Ink Cartridge No 45 Black for DJ 710C/720C/830C - C1645AA	\$41	\$3
HPD0990	HP Ink Cartridge No 49 Colour for DJ 600/610C/630C - C1649AA	\$42	\$12
HPD6656	HP Ink Cartridge No 56 Black for DJ 5550 - C6656AA	\$28	\$7
HPD6657	HP Ink Cartridge No 57 Colour for DJ 5550C - C6657AA	\$45	\$13
HPD6658	HP Ink Cartridge No 58 Photo Colour for DJ 5550 - C6658AA	\$34	\$10
HPD9359	HP Ink Cartridge No 59 Grey Photo - C9359AA	\$35	\$15
HPD6578	HP Ink Cartridge No 78 Colour for DJ 900/1220C - C6578DA	\$45	\$13
HP1038	HP Ink Cartridge No 78 Large Colour for DJ 900/1220C - C6578AA	\$83	\$12

HP Mono LaserJet Toner Cartridges

WebCode	Product Description	Price	SAVE
HPL2612	HP Toner Cartridge for LaserJet 1010/1015 - Q2612A	\$90	\$35
HPLA092	HP Toner Cartridge for LaserJet 1100/3200 Series 2,500 Pages - C4092A	\$75	\$24
HPL2624	HP Toner Cartridge for LaserJet 1150 Series - Q2624A	\$102	\$29
HPL7117	HP Toner Cartridge for LaserJet 1200 Series 3,500 Pages - C7115X	\$99	\$35
HPL2614	HP Toner Cartridge for LaserJet 1300 Series 4,000 Pages - Q2613X	\$115	\$39
HPLA096	HP Toner Cartridge for LaserJet 2100/2200 Series 5,000 Page - C4096A	\$129	\$45
HPL2610	HP Toner Cartridge for LaserJet 2300 Series - Q2610A	\$155	\$46
HP620	HP Toner Cartridge for LaserJet 45 Series 6,000 Pages - 92298A	\$124	\$21
HPL4129	HP Toner Cartridge for LaserJet 4000 Series 10,000 Pages - C4127X	\$165	\$50
HPL8063	HP Toner Cartridge for LaserJet 4100 Series 12,000 Pages - C8061X	\$165	\$60
HPL1338	HP Toner Cartridge for LaserJet 4200 Series 10,000 Pages - Q1338A	\$197	\$59
HPL1339	HP Toner Cartridge for LaserJet 4300 Series - Q1339A	\$262	\$79
HPLA182	HP Toner Cartridge for LaserJet 8100 Series 20,000 Pages - C4182X	\$243	\$52
HP8543	HP Toner Cartridge for LaserJet 9000 Series 30,000 - C8543X	\$355	\$108
HP1175	HP Toner Cartridge for LaserJet 5P/5MP/6P/6MP Series - C3903A	\$106	\$13
HPL7115	HP Toner Cartridge for LaserJet 1200 Series 2,500 Pages - C7115A	\$80	\$25
HP741	HP Toner Cartridge for LaserJet 5L/6L Series - C3906A	\$80	\$25
HPLA131	HP Toner Cartridge for LaserJet 5000 - C4129X	\$211	\$74
HP5949	HP Toner Cartridge for LaserJet 1160/1320 - C5949A	\$92	\$34

HP Colour LaserJet Toner Cartridges

WebCode	Product Description	Price	SAVE
HPL9700	HP Toner Cartridge for Colour LaserJet 1500/2500 Black - C9700A	\$107	\$48
HPL9701	HP Toner Cartridge for Colour LaserJet 1500/2500 Cyan - C9701A	\$129	\$46
HPL9703	HP Toner Cartridge for Colour LaserJet 1500/2500 Magenta - C9703A	\$129	\$46
HPL9702	HP Toner Cartridge for Colour LaserJet 1500/2500 Yellow - C9702A	\$129	\$46
HPL3960	HP Toner Cartridge for Colour LaserJet 2550 Black - C3960A	\$108	\$20
HPL3978	HP Toner Cartridge for Colour LaserJet 2550 Cyan - Q3961A	\$129	\$38
HPL3981	HP Toner Cartridge for Colour LaserJet 2550 Magenta - Q3963A	\$129	\$38
HPL3979	HP Toner Cartridge for Colour LaserJet 2550 Yellow - Q3962A	\$129	\$38
HPL2670	HP Toner Cartridge for Colour LaserJet 3500/3700 Black - Q2670A	\$170	\$52
HPL2673	HP Toner Cartridge for Colour LaserJet 3500/3700 Cyan - Q2673A	\$170	\$52
HPL2672	HP Toner Cartridge for Colour LaserJet 3500/3700 Magenta - Q2672A	\$170	\$52
HPL9720	HP Toner Cartridge for Colour LaserJet 4600/4650 Black - C9720A	\$200	\$75
HPL9721	HP Toner Cartridge for Colour LaserJet 4600/4650 Cyan - C9721A	\$270	\$89
HPL9723	HP Toner Cartridge for Colour LaserJet 4600/4650 Magenta - C9723A	\$270	\$89
HPL9722	HP Toner Cartridge for Colour LaserJet 4600/4650 Yellow - C9722A	\$270	\$89
HPL9730	HP Toner Cartridge for Colour LaserJet 5500 Black - C9730A	\$289	\$87
HPL9731	HP Toner Cartridge for Colour LaserJet 5500 Cyan - C9731A	\$405	\$123
HPL9733	HP Toner Cartridge for Colour LaserJet 5500 Magenta - C9733A	\$405	\$123
HPL9732	HP Toner Cartridge for Colour LaserJet 5500 Yellow - C9732A	\$405	\$123

Visit www.csw.com.au for the full range of the above listed brands and other popular brands including Kyocera-Mita, Brother, Fuji Xerox and Samsung.

Canon Ink Cartridges

WebCode	Product Description
BC138BK	Canon Ink Cartridge Black - BC138BK
BC138C	Canon Ink Cartridge Cyan - BC138C
BC138M	Canon Ink Cartridge Magenta - BC138M
BC138Y	Canon Ink Cartridge Yellow - BC138Y
CAN0010	Canon Ink Cartridge Black - BC218BK
CAN0011	Canon Ink Cartridge Cyan - BC218C
CAN0066	Canon Ink Cartridge Black - BC218BK
CAN0055	Canon Ink Cartridge Black Twin - BC124
CAN0164	Canon Ink Cartridge Colour Twin - BC124
CAN0065	Canon Ink Cartridge Colour - BC124C
CAN0048	Canon Ink Cartridge Black - BC168K
CAN0050	Canon Ink Cartridge Cyan - BC168C
CAN0051	Canon Ink Cartridge Magenta - BC168M
CAN0053	Canon Ink Cartridge Yellow - BC168Y
CAN0049	Canon Ink Cartridge Photo Cyan - BC168PC
CAN0052	Canon Ink Cartridge Photo Mag - BC168PM
CAN0210	Canon Ink Cartridge Colour - BC115C
CO058	Canon Ink Cartridge Black - BC20
CAN0011	Canon Ink Cartridge Colour - BC21C

EPSON Ink Cartridges

WebCode	Product Description
EPA1040	Epson Ink Cartridge for Stylus C41UX/SX/C43UX/SX Black - T038
EPA1041	Epson Ink Cartridge for Stylus C41UX/SX/C43UX/SX Colour - T039
EPA0060	Epson Ink Cartridge for Stylus C60/61 Black - T028
EPA0061	Epson Ink Cartridge for Stylus C60/61 Colour - T029
EPA6190	Epson Ink Cartridge for Stylus C63/CB3 Black - T0461
EPA7290	Epson Ink Cartridge for Stylus C63/CB3 Cyan - T047290
EPA7390	Epson Ink Cartridge for Stylus C63/CB3 Magenta - T047390
EPA7490	Epson Ink Cartridge for Stylus C63/CB3 Yellow - T047490
EPA7011	Epson Ink Cartridge for Stylus C70/CB0/CB2 Black - T032190
EPA7022	Epson Ink Cartridge for Stylus C70/CB0/CB2 Cyan - T032290
EPA7033	Epson Ink Cartridge for Stylus C70/CB0/CB2 Magenta - T032390
EPA7044	Epson Ink Cartridge for Stylus C70/CB0/CB2 Yellow - T032490
EPA7012	Epson Ink Cartridge for Stylus CB2 Cyan - T042290
EPA7013	Epson Ink Cartridge for Stylus CB2 Magenta - T042390
EPA7014	Epson Ink Cartridge for Stylus CB2 Yellow - T042490
EPA1305	Epson Ink Cartridge for Stylus 440/460/640 Black - T050190
EPA2127	Epson Ink Cartridge for Stylus 440/600/800 Colour - T052090
EPA0890	Epson Ink Cartridge for R210/R310/RX510 Black - T0492
EPA0511	Epson Ink Cartridge for R210/R310/RX510 Cyan - T0493
EPA0514	Epson Ink Cartridge for R210/R310/RX510 Light Cyan - T0495
EPA0515	Epson Ink Cartridge for R210/R310/RX510 Light Magenta - T0496
EPA0512	Epson Ink Cartridge for R210/R310/RX510 Magenta - T0493
EPA0513	Epson Ink Cartridge for R210/R310/RX510 Yellow - T0494
EPA0810	Epson Ink Cartridge for Stylus 810/830U/925/935 Black - T026
EPA0811	Epson Ink Cartridge for Stylus 810/830U/925/935 Colour - T027
EPA5404	Epson Ink Cartridge for Stylus 1270/1290 Colour - T009
EPA1270	Epson Ink Cartridge for Stylus 1270/1290 Colour - T009

Lexmark Toner Cartridges

WebCode	Product Description	Price	SAVE
LEX9481	Lexmark Toner Cartridge for Optra T 25k - 12A5845	\$423	\$149
LEX5224	Lexmark Toner Cartridge for Optra T 52k - 12A6835	\$423	\$149
LEX6223	Lexmark Toner Cartridge for Optra T 62k - 12A6835	\$473	\$133
LEX9642	Lexmark Toner Cartridge for Optra T 630/634 - 12A7465	\$463	\$129
LEX9639	Lexmark Toner Cartridge for Optra T 630/632 - 12A7462	\$433	\$95

Konica Minolta Toner Cartridges

WebCode	Product Description	Price	SAVE
QMS1302	Konica Minolta Toner Cartridge for 1300W/6K	\$135	\$26
QMS1303	Konica Minolta Drum Cartridge for 1300W/20K	\$151	\$24
QMS2304	Konica Minolta High Capacity Toner Cartridge for 2300W - Black	\$124	\$20
QMS2305	Konica Minolta High Capacity Toner Cartridge for 2300W - Yellow	\$187	\$29
QMS2306	Konica Minolta High Capacity Toner Cartridge for 2300W - Magenta	\$187	\$29
QMS2307	Konica Minolta High Capacity Toner Cartridge for 2300W - Cyan	\$187	\$29
QMS2404	Konica Minolta High Capacity Toner Cartridge for 2400W - Black	\$130	\$14
QMS2407	Konica Minolta High Capacity Toner Cartridge for 2400W - Cyan	\$194	\$22
QMS2406	Konica Minolta High Capacity Toner Cartridge for 2400W - Magenta	\$194	\$22
QMS2405	Konica Minolta High Capacity Toner Cartridge for 2400W - Yellow	\$194	\$22
QMS5446	Konica Minolta Toner Cartridge for 5440 - Black	\$237	\$40
QMS5449	Konica Minolta Toner Cartridge for 5440 - Cyan	\$340	\$58
QMS5448	Konica Minolta Toner Cartridge for 5440 - Magenta	\$340	\$58
QMS5447	Konica Minolta Toner Cartridge for 5440 - Yellow	\$340	\$58

Lexar 256MB MP3 Player

The Lexar Digital Music Player LDR-600 is a full-featured Digital Music player, which lets you listen and carry your favorite music wherever you go. It supports MP3 and WMA formats. It includes an FM Radio with FM recording and Voice Recorder. It also includes an integrated FM transmitter so you can listen to your music files on any radio.



Our Price **\$180** ~~Save \$40~~
WebCode LXA1020

Logitech Z-5500 Digital THX Speakers

Immerse yourself in high-fidelity digital surround sound with Logitech's THX-certified, 500 watt Z-5500 Digital 5.1 speaker system. The SoundTouch Digital Control Center supports Dolby Digital, DTS, and DTS 96/24 soundtracks and includes digital and analog inputs for connecting DVD players, PCs, video game consoles, CD players, and more.



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WebCode LOG3466

HitVideoLab Home Theatre Headset

Get the most out of your next DVD viewing experience! The HitVideoLab 5 channel home theatre headset is an innovative way for people to enjoy the awesome sound of Dolby Digital AC-3 or DTS Digital Surround.



Our Price **\$99** ~~Save \$140~~
WebCode HVL0001

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Australian Guide to Online Genealogy

Written specifically for Australians, as a clear, easy-to-follow guide, *The Australian Guide to Online Genealogy* combines tips and techniques on how to use the Internet and how to begin tracing your ancestry.



Book-Paperback
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Secrets of the iPod, 5E

Thoroughly updated guide reveals the secrets to using the world's most popular digital music player.



Book-Paperback
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WebCode: PGN0116

The Concise Penguin Dictionary of Computing

This highly accessible dictionary is the ideal source of information on all aspects of the world and language of computers. Covering terms from A20 gate to Zip drive, via floppy disk, matrix and Word for Windows, *The Concise Penguin Dictionary of Computing* will be invaluable not only to experts, including programmers and engineers, but to anyone who owns or uses a computer and wishes to improve their skills.



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Complete Wireless Home Networking

An all-in-one guide that covers every angle of home wireless networking - from product selection to implementation and maintenance.

- Targets home wireless networking, explaining how to add wireless devices of all types, it also has a section for the best free advice on the Web.



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Looking to network your entire home? This is one of the only networking books you'll ever need! Setting up a home network doesn't need to be difficult. You can use this easy-to-understand reference to set up your home network, secure it, and turn it into an entertainment network. Don't be fooled by other guides - it can be that simple!



Book-Paperback
Our Price **\$31** Save **\$8**
WebCode: PGN0017

Absolute Beginner's Guide to Home Networking

You want to network your home but where do you start? Network your life, not just your computers! The perfect start for those starting out.



Book-Paperback
Our Price **\$23** Save **\$6**
WebCode: PGN0015

Defend I.T.: Security By Example

Reports of computer crime and incidents from the CERT Coordination Center at Carnegie Mellon University more than double each year and are expected to rise. Meanwhile, viruses and worms continue to take down organizations for days. *Defend I.T.*: Security by Example contains a plethora of real life case studies illustrating how to secure your computer network once and for all.



Book-Paperback
Our Price **\$42** Save **\$12**
WebCode: PGN0001

The Photoshop Elements 3 Book for Digital Photographers

The software is one of the most sought after photo editing packages around - now get the book on how to take advantage of the features! Edit images like a pro in this *Photoshop Elements 3* handbook for digital photographers from best-selling author Scott Kelby.



Book-Paperback
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Absolute Beginner's Guide to Digital Photography

You have a digital camera, now what? Thanks to memory sticks, docking stations, computers, image editing software, and printers, using your new digital camera can be frustrating and intimidating. With *Absolute Beginner's Guide to Digital Photography*, you'll learn everything you need to know to take great digital pictures and share them with friends or family.



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How Secure Is Your Wireless Network? Safeguarding Your Wi-Fi LAN

Step-by-step guidelines and best practices for deploying secure wireless LANs in an enterprise or home environment. And also within community networks.

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Simple, easy to follow step-by-step guide for the beginner on adding data, audio and digital to CDs and DVDs.

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10 years, 10 editions: the multi-million-selling Internet book has come of age and is still the ultimate handbook for novices and experts alike. Written in plain English, it covers everything from getting online for the first time to advanced tips and tricks guaranteed to turn casual surfers into Net gurus. Whether you've never sent an email or you want to keep up with the latest developments, you need this book.



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Upgrade (COR8673) \$448



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Paint Shop Pro Studio

Paint Shop Pro Studio makes all your photo projects fun and easy. Photo restoration and editing, organizing and sharing, scrapbooking, home remodeling, whatever you want to do with your photos, Paint Shop Pro Studio has the tools you need for fast, fantastic results. Include Paint Shop Photo Album Standard Edition FREE.



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Adobe® Photoshop® CS2 software, the professional image-editing standard and leader of the Photoshop digital imaging line, delivers groundbreaking creative tools; unprecedented adaptability; and more efficient editing, processing, and file handling.
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Upgrade from Photoshop	Upgrade from CS	Full
Our Price \$844 Save \$244	Our Price \$588 Save \$177	Our Price \$1414 Save \$450
WebCode Mac: ALD9556 WebCode Win: ALD9557	WebCode Mac: ALG0030 WebCode Win: ALG0031	WebCode Mac: AL09554 WebCode Win: AL09555

Adobe® Creative Suite 2 Premium

Adobe® Creative Suite 2 Premium software is a unified design environment that combines full new versions of Adobe Photoshop® CS2, Illustrator® CS2, InDesign® CS2, GoLive® CS2, and Acrobat® 7.0 Professional software with new Version Cue® CS2, the Adobe Bridge file browser, and Adobe Stock Photos. Delivering the next level of integration in creative software, plus consistent color and Adobe PDF file creation across components, Adobe Creative Suite 2 enables you to realize your ideas anywhere—in print, on the Web, or on mobile devices.

Includes:

- **Adobe Photoshop**
Adobe® Photoshop® CS2 software, the professional image-editing standard and leader of the Photoshop digital imaging line, delivers groundbreaking creative tools; unprecedented adaptability; and more efficient editing, processing, and file handling.
- **Illustrator**
Adobe® Illustrator® CS2 software gives you powerful new creative options, easier access to tools, and the versatility to quickly produce flexible graphics for print, video, the Web, and mobile devices.
- **InDesign**
With its sophisticated design and production controls and unmatched integration with other Adobe applications, Adobe® InDesign® CS2 software is not only a better choice for page layout—it's a superior way to work.
- **GoLive CS2**
Unlock the power of CSS with intuitive visual tools, easily take your existing Adobe design assets to the Web, and build and manage Web and mobile sites using the advanced, standards-based coding environment in Adobe® GoLive® CS2 software.
- **Acrobat 7.0 Professional**
Adobe® Acrobat® 7.0 Professional software is the advanced way to create, control, and deliver more secure, high-quality Adobe PDF documents.
- **Version Cue file-version manager**
Access both historical versions and parallel "alternates" of project files, including both Adobe and common non-Adobe file formats, in Version Cue® CS2.
- **Adobe Bridge file browser**
Efficiently organize, browse, locate, and preview the assets you need every day from within the new Adobe Bridge visual file browser.
- **Adobe Stock Photos**
Browse and search royalty-free images from multiple leading stock photo agencies in one convenient, familiar location using Adobe Stock Photos. Purchase images from several agencies in a single shopping cart, and manage your imagery without ever leaving Adobe Creative Suite.

Education	Upgrade from CS	Upgrade from Photoshop	Full
Our Price \$557 Save \$152	Our Price \$869 Save \$328	Our Price \$1249 Save \$79	Our Price \$1829 Save \$653
WebCode Mac: AEP0183 WebCode Win: AEP0184	WebCode Mac: ALG0028 WebCode Win: ALG0029	WebCode Mac: ALD9560 WebCode Win: ALD9561	WebCode Mac: AL09558 WebCode Win: AL09559

1300 658 600



Adobe® Photoshop® CS2

Adobe® Photoshop® CS2 software, the professional image-editing standard and leader of the Photoshop digital imaging line, delivers more of what you crave. Groundbreaking technology helps you create and enhance images with extraordinary results. Unprecedented adaptability lets you custom-fit Photoshop to the way you work. And with exceptionally smooth editing, processing, and file handling, there's no slowing you down. Bring your images to life with Photoshop CS2.

- Create extraordinary images with groundbreaking technology
- Be more productive with an intuitive workspace that you can adapt to your needs.
- Save time with smoother file handling and multi-image digital camera raw file processing.

Upgrade		Full		
Our Price	\$289	Save \$48	Our Price \$995	Save \$243
WebCode Mac	ALG0049	WebCode Mac	ALD9552	
WebCode Win	ALG0050	WebCode Win	ALD9553	

Adobe® Acrobat® 7.0 Professional

Adobe® Acrobat® 7.0 Professional software is the advanced way to create, control, and deliver more secure, high-quality Adobe PDF documents. Assemble electronic or paper files—even Web sites, engineering drawings, and e-mail—into reliable PDF documents that are easy to share with others using free Adobe Reader® 7.0 software. Manage document reviews, synthesizing feedback from multiple reviewers while preserving document format and integrity. Extend commenting capabilities to anyone using Adobe Reader 7.0. Windows® users can design intelligent Adobe PDF forms that include business logic, such as calculations and data validations, to help increase the accuracy of data collection while reducing the costs of manual data entry.

Standard Upgrade \$155 Standard Academic \$132 Professional Academic \$198

Upgrade from 4 to 8 Standard		Upgrade from 6 Pro		Full		
Our Price	\$249	Save \$60	Our Price \$249	Save \$60	Our Price \$638	Save \$228
WebCode Mac	ADU0074	WebCode Mac	ADU0072	WebCode Mac	ALD9526	
WebCode Win	ADU0075	WebCode Win	ADU0073	WebCode Win	ALD9527	

Adobe® Illustrator® CS2

Adobe® Illustrator® CS2 software gives you new creative freedom that lets you realize your ideas quickly and powerfully. Instantly convert bitmaps to editable and scalable vector artwork, paint more intuitively, and use advanced type and precise drawing tools. Save time with intelligent toolbars, optimized workspaces, and bonus fonts and templates that help you jump-start your designs. Plus, tight integration with other software provides the flexibility you need to produce extraordinary graphics for print, video, the Web, and mobile devices.

- Quickly convert bitmaps to vectors with new Live Trace, and colorize intuitively with Live Paint.
- Find tools faster with an interface that's customizable to the way you work.
- Display your work using industry-standard formats such as SVG, PDF/X, PDF, PSD, and more.
- Work more efficiently with other Adobe applications, Macromedia® Flash® (SWF), QuarkXPress, and Microsoft Office.

Upgrade		Full		
Our Price	\$295	Save \$85	Our Price \$891	Save \$202
WebCode Mac	ALG0041	WebCode Mac	ALD9550	
WebCode Win...	ALG0042	WebCode Win...	ALD9551	

Adobe® InDesign® CS2

Join the growing ranks of creative professionals discovering new levels of creative freedom and productivity using Adobe® InDesign® CS2 software. Tightly integrated with the Adobe applications you use most, including Adobe Photoshop®, Illustrator®, Acrobat®, GoLive®, and InCopy® software, InDesign CS2 delivers faster production workflows and a more fluid creative environment for designing and outputting professional page layouts. Explore the rich support for typography, graphics, transparency effects, object styles, text styles, and other sophisticated design and production features that have inspired the creative community worldwide.

- Design professional page layouts using unparalleled support for native Adobe file formats, sophisticated typographical controls, and rich creative options, including transparency effects, flexible table creation, object and text styles, and more.

PageMaker to InDesign		Upgrade		Full		
Our Price	\$595	Save \$171	Our Price \$295	Save \$85	Our Price \$1242	Save \$281
WebCode Mac	ALG0044	WebCode Mac	ALG0043	WebCode Mac	ALD0476	
WebCode Win	ALG0045	WebCode Win	ALG0045	WebCode Win	ALD0477	

Adobe® GoLive® CS2

Adobe® GoLive® CS2 software lets you unlock the power of CSS with intuitive visual tools such as prebuilt CSS objects that you can drag and drop to build sophisticated sites. Jump-start your designs by automatically converting Adobe InDesign® layouts into XHTML or CSS Web pages. Or, design leading-edge Web and mobile content and applications in an advanced coding environment that supports SVG, Tiny, SMIL, MMS, MPEG-4, XHTML, CSS, and other open global standards. Maintain your sites with comprehensive site management tools.

- Build sophisticated CSS-based Web content in an intuitive visual environment and enjoy comprehensive site maintenance.
- Efficiently create or leverage assets for your Web and mobile sites through tight integration with Adobe® Creative Suite 2.
- Design mobile sites and applications based on open standards, using visual authoring tools and native device emulation.

Upgrade		Full		
Our Price	\$295	Save \$85	Our Price \$715	Save \$162
WebCode Mac	ALG0039	WebCode Mac	ALD9548	
WebCode Win	ALG0040	WebCode Win	ALD9549	

Adobe Photoshop Elements 3

50 Ways To Create Cool Pictures

Author Dave Huss covers all of these tools in this practical, fun guide to learning Photoshop Elements 3. This book covers both the Macintosh and Windows versions of Photoshop Elements 3.



Book-Paperback	
Our Price	\$39
	Save \$10
WebCode	PGN0038

Adobe Creative Suite All In One

All the answers for beginning users of Adobe's graphics products in one big, easy to use book. It doesn't assume the reader wants to learn how to use just one product, but covers multiple products and technologies together in a logical, well-integrated fashion.



Book - Paperback	
Our Price	\$48
WebCode	PGN0032

Total Training Digital Photography & Adobe Photoshop Elements 3

Photography expert, Brian Moffitt, clarifies the processes of importing pictures to a computer, manipulating and adjusting them in Photoshop Elements, and sharing them.



Our Price		\$94	Save \$5
WebCode...		TOT0004	

QuarkXPress 6.5

Much more than a page layout tool, QuarkXPress 6.5 provides proven performance with graphics and colour management, text processing, Web-page design, XML, output and more!

QuarkXPress is powerful layout software with an intuitive, versatile interface that lets you combine writing, editing, and typography with color and pictures to produce dynamic final output.

- Supports Mac OS X v10.3, Windows 2000, and Windows XP

• Perform advanced image manipulation functions within QuarkXPress to match it with the surrounding page layout.

- Import native Adobe QuarkXPress layouts while keeping the layers, channels, and paths intact.

Upgrade from 4 **\$595**

Upgrade from 5 **\$635**

Academic **\$1199**



Our Price \$2352 **Save \$78**
WebCode Win... QUA0013
WebCode Mac... QUA0032

Centennial Media Dreamweaver MX Training

Dreamweaver MX 2004 package includes 3 CDs of training for Dreamweaver MX and 1 CD of training for Dreamweaver MX 2004 new features. Your trainer is Macromedia Specialist Trainer Paul Le Fevre. Comprehensive training for designers and developers alike.



Our Price \$329 **Save \$34**
WebCode... CEN0052

Macromedia ColdFusion MX 7

The most significant release of ColdFusion since its inception ten years ago. Still the fastest, easiest way to build and deploy powerful Internet applications, ColdFusion MX 7 introduces a powerful, new services for rich Flash and XForms generation, integrated business reports, dynamic generation of printable documents, and application access through Instant Messaging and SMS text messaging on mobile devices. Used alone or in conjunction with J2EE or .NET solutions, ColdFusion MX 7 solves new classes of problems while reducing development time and costs.

Standard Academic (MME2006) **\$974**

Standard Upgrade (MAC2005) **\$752**

Enterprise Upgrade (MMC2001) **\$3498**

Enterprise (MMC2000) **\$6542**

Our Price \$1479 **Save \$339**
WebCode... MMC2004



Macromedia Captivate

Create professional-quality, interactive Flash simulations and software demonstrations. Without programming or multimedia skills, automatically record all on-screen actions to instantly create demonstrations complete with mouse movements and test captions, or simulations with scored interactions and instructional feedback. Point and click to edit, customize, or add eLearning interactions. Captivate files are small in size, high resolution, and are SCORM/AICC compliant for easy LMS deployment. Seamless integration with Macromedia Breeze and Flash MX 2004 provides design, development, and delivery capabilities.

Academic (MME0236) **\$286**

Upgrade (MMC1093) **\$418**

Our Price \$689 **Save \$129**
WebCode... MMC1092



Macromedia Contribute 3

Macromedia Contribute 3 redefines web publishing, making it an activity open to everybody, everyday, requiring no technical expertise. Contribute 3 lets everyone in an organization publish to websites, bringing them alive with up-to-date content and effective communication.

Academic (MME0235) **\$132**

Upgrade (MMC0229) **\$117**

6 Pack (MMC0228) **\$1025**

Our Price \$225 **Save \$31**
WebCode... MMC0227



Macromedia Flash MX Pro 2004

Improved rich media support, streamlined publishing and robust features to jumpstart development of interactive experiences plus advanced functions for creating interactive content, professional quality video experiences, and mobile phones and devices.

Academic (MAC0224) **\$232**

Upgrade (MAC0212) **\$465**

Standard (MAC0209) **\$770**

Standard Upg (MAC0210) **\$309**

Standard Acc (MAC0223) **\$145**



Our Price \$1068 **Save \$62**
WebCode... MAC0211

Macromedia Dreamweaver MX 2004

A powerful combination of visual layout tools, application development features, and code editing support, enabling developers and designers at every skill level to create visually appealing, standards-based sites and applications quickly. Dreamweaver provides the tools professionals need in an integrated, streamlined environment.

Academic (MAC0221) **\$145**

Upgrade (MAC0204) **\$302**

Our Price \$598 **Save \$111**
WebCode... MAC0203



Macromedia Fireworks MX 2004

Create, optimize and integrate great-looking web graphics. Fireworks MX 2004 provides professional control that enables easy creation of sophisticated rollover effects, multi-state buttons and pop-up menus. Fireworks MX 2004 streamlines productivity with enhanced performance and third-party web development tools.

Academic (MAC0222) **\$154**

Upgrade (MAC0208) **\$230**



Our Price \$468 **Save \$25**
WebCode... MAC0207

Macromedia Studio MX 2004

Macromedia Studio MX 2004 integrates the leading professional tools for developing the full range of web sites and internet applications. Build websites and applications with Dreamweaver, create interactive content with Flash, generate web graphics with Fireworks, and incorporate vector graphics with FreeHand. Streamline web development workflow, enhancing productivity and ease-of-use. For developers delivering rich interactive applications, also available with Flash Professional.

Academic (MAC0300) **\$284**

Upgrade from MX (MAC0216) **\$607**

Upgrade from any Macromedia product (MAC0215) **\$759**

Full with Flash Pro (MAC0217) **\$1475**

Academic with Flash Pro (MAC0301) **\$359**

Our Price \$1255 **Save \$338**
WebCode... MAC0214



Macromedia Web Publishing System

The Macromedia Web Publishing System is a scalable, complete solution for businesses to affordably build, manage, and publish to websites.

The Web Publishing System starter 10-pack consists of:

- 10 Contribute 3 licenses for business users
- 1 Studio MX 2004 with Flash Professional and 1 Contribute 3 license for a web developer
- 11 Contribute Publishing Services user access licenses
- Plus Contribute and Contribute Publishing Services maintenance for 1 year

The system meets the full spectrum of needs for web developers, IT managers, and business professionals—empowering users to easily publish to the web within a centrally controlled, standards-based environment.

Our Price \$3558 **Save \$441**
WebCode... MMC0231



Macromedia Director MX 2004

The tool for building rich, interactive content for applications, corporate demonstrations, and games—that delivers measurable results.

Academic (MME0043) **\$730**

Upgrade (MMC0185) **\$612**

Our Price \$1845 **Save \$393**
WebCode... MMC0184



Macromedia Freehand MX

Concept and design visually-rich graphics for print and web with Macromedia Freehand MX, the multi-publishing design solution with powerful illustration and drawing tools and an open, streamlined workflow.

Academic **\$145**

Upgrade from 10 **\$175**

Upgrade from 9 **\$249**

Our Price \$578 **Save \$74**
WebCode Mac... MAC0138
WebCode Win... MAC0139



AutoCAD LT 2006

You've spoken and we've listened. The world's number one seller for 2D drafting and detailing, AutoCAD LT® software is better than ever. With AutoCAD LT 2006, hatching is more flexible, dimensioning is improved, and text editing works the way you always wanted it to. Add a more intuitive interface, and the tasks you perform every day are streamlined with just one thing in mind—boosting your productivity. With enhanced editing tools, seamless document sharing, full DWG file format compatibility, and the elimination of tedious workarounds, you've never experienced a more efficient design process.

**AutoCAD LT
2006**

Autodesk

AutoCAD 2006

AutoCAD® 2006, the 20th release of AutoCAD software, builds upon a tradition of innovation, resulting in true out-of-the-box productivity. Migration is easy, deployment is simple, and intuitive new features make learning a snap. New drafting and annotation tools such as Dynamic Blocks and enhanced hatching eliminate the need for time-consuming workarounds. These new features in conjunction with powerful existing tools like the Sheet Set Manager and tool palettes offer a complete set of tools to manage everything from simple to complex projects.

Upgrade from 2004 (AUT0086) **\$1828**
Upgrade from 2002 (AUT0087) **\$2739**

**AutoCAD
2006**

Autodesk

Full Version **Our Price \$1885 Save \$260**
Upgrade **Our Price \$685 Save \$65**
WebCode: AUT0082 WebCode: AUT0083

Full Version **Our Price \$5979 Save \$621**
Upgrade from 2004 **Our Price \$915 Save \$53**
WebCode: AUT0084 WebCode: AUT0085

Autodesk VIZ 2006

Award-winning Autodesk VIZ provides a fluid 3D environment for modeling, rendering and animation. Whether you're an architect, land planner or mechanical designer, you can use Autodesk VIZ throughout the design process to develop and explore concepts and alternatives, communicate design intent to clients and validate your design to ensure they are error free. Autodesk VIZ, a multimedia software tool that brings your designs alive.

Upgrade from 2005 (AUT0093) **\$770**

**AUTODESK
VIZ
2006**

Autodesk

Full Version **Our Price \$3345 Save \$175**
WebCode: AUT0092

Autodesk Raster Design 2006

Now you can easily use and reuse existing design data in scanned maps, drawings, aerial photographs, and satellite imagery. Autodesk Raster Design, the editing and image-processing tool that works inside your AutoCAD software-based application, can save hours of drawing time by converting raster to vector and combining drawings with real-world imagery.

**AUTODESK
RASTER DESIGN
2006**

Autodesk

Full Version **Our Price \$2822 Save \$170**
WebCode: AUT0091

Autodesk DWF Composer 2

Accelerate design reviews with Autodesk® DWF™ Composer, the all-digital way to review, mark up, and revise 2D and 3D designs. View and print DWF and DWF™ files with accuracy and fidelity, then measure and annotate the DWF file before round-tripping the markups for revisions. Cycle time, errors, and costs will shrink. Efficiency, however, will soar.

Upgrade (AUT0094) **\$160**

**AUTODESK
DWF COMPOSER**

Autodesk

Full Version **Our Price \$329 Save \$23**
WebCode: AUT0090

AutoSketch 9

AutoSketch 9 software provides a comprehensive set of CAD tools for creating precision drawings—from electrical details to floor plans, from conceptual sketches to product specifications, and much more. Offers straightforward drafting in a Windows XP-like environment plus tutorials and wizards for a fast start.



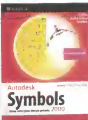
Autodesk

Full Version **Our Price \$192 Save \$28**
WebCode: AUT0077

Autodesk Symbols 2000

Autodesk Symbols 2000 simplifies routine drawing tasks and boosts productivity through a toolbar-style graphical interface, which guides you rapidly through a wide selection of technically correct symbols. With a click of the mouse symbols are placed easily and exactly where they are needed.

Architectural Series contains over 5,600 symbols for building design and documentation. Engineering Series containing over 10,800 symbols covering all aspects of Engineering.



Autodesk

Architectural **Our Price \$189 Save \$31**
Engineering **Our Price \$189 Save \$31**
WebCode: AC00098 WebCode: AC00099

Autodesk Volo View 3

Using Volo View 3, team members can view, mark up, measure, print, and plot AutoCAD 2004, Autodesk Inventor 7, and raster formats as well as DWF (Design Web Format) files without the original design creation software. The files display and print exactly as the document creator intended—with rich design information, such as layers, views, and measurements.

Upgrade (AUT0043) **\$163**



Autodesk

Full Version **Our Price \$319 Save \$33**
WebCode: AUT0042

Inventor Series

- Autodesk Inventor
- Autodesk Mechanical Desktop
- AutoCAD Mechanical
- AutoCAD (included as part of AutoCAD Mechanical)



NEW
Our Price **\$249 Save \$26**
WebCode: AUT0078

Revit Series

- Autodesk Revit
- AutoCAD



NEW
Our Price **\$249 Save \$26**
WebCode: AUT0074

Building Series

- Autodesk Architectural Desktop
- AutoCAD (included as part of Autodesk Architectural Desktop)



NEW
Our Price **\$249 Save \$26**
WebCode: AUT0072

AutoCAD, AutoCAD Civil 3D and Autodesk VIZ student versions also available separately.

Microsoft Works 8

Works 8 is the latest version of the popular essential home productivity software. It includes a word processor, spreadsheet, database and calendar. Plus, Works 8 has new, professionally designed templates and a new tool to help organise common projects. Buy Works 8 and upgrade to Office for less!



Our Price **\$82** Save **\$17**
WebCode MSC2920

Microsoft Digital Image Suite 10

Packed with all of the tools you need to organise your photos, edit them using hundreds of tools, print and share your work and archive photos for safekeeping. Licensing pricing available.

Picture It Photo Premium 10 (MSC2922) \$63



Our Price **\$97** Save **\$22**
WebCode MSC2921

Microsoft Encarta Premium Suite 2005

Encyclopedia with research and learning tools. Dictionary & Thesaurus, Literature Guides and Chart Maker. Licensing pricing available.

Standard 2005 (MSC2470) \$22

Premium CD (MSC2471) \$69



DVD
Our Price **\$69** Save **\$10**
WebCode MSC4472

Microsoft Works Suite 2005

Works Suite includes five popular Microsoft home products in one easy-to-use package. Works Suite includes Microsoft Works, Microsoft Word and the latest versions of Microsoft Money Standard, Microsoft Encarta Standard, and Microsoft Picture It! Photo Premium.

Buy Works Suite and upgrade to Office for less!



Our Price **\$139** Save **\$30**
WebCode MSC2924

Microsoft MSDN Universal 7

Provides priority access to essential resources for developers, including timely delivery of everything you need to build XML Web services and applications. Get uninterrupted access to the latest Microsoft technologies 24 hours a day, 7 days a week online and through regular CD or DVD updates.

Upgrade/Renewal (MSA0778) \$2975



Full
Our Price **\$3629** Save **\$264**
WebCode MSA0777

Microsoft Exchange Server 2003 Standard

Designed to meet the messaging and collaboration needs of small and medium-size corporations. With Exchange 2003 Standard Edition, you get:

- Exchange 2003
- The flexibility to be configured as a Microsoft Office Outlook Web Access front-end server
- 16-gigabyte data storage maximum

Full (MSS2081) \$1979

for non-commercial use only Academic

Our Price **\$1078** Save **\$98**
WebCode MSS2080



Microsoft Visual Studio.NET Professional

Visual Studio.NET Professional will enable developers to build next generation Internet applications that target any Internet device and integrate with any platform.

Upgrade (MSA9837) \$832

Full (MSA9836) \$1299



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Our Price **\$140** Save **\$18**
WebCode MSA9819

Microsoft Publisher 2003

Publisher 2003 is a comprehensive solution for creating and publishing a wide variety of publications for desktop printing, commercial printing, e-mail distribution, or viewing on the Web. Publisher 2003 looks and works more like other programs in the Microsoft Office System, making it easier to use the right Office tool for the task.

Upgrade (MSA4235) \$159

Full (MSA4234) \$269



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Our Price **\$142** Save **\$17**
WebCode MSA4233

Microsoft Visio 2003 Std

Microsoft Office Visio 2003 gives business and technical users the power to visualise and communicate ideas, information, and systems. Use the simple, flexible tools in Visio 2003 to easily create business and technical charts and graphics that capture your inspiration and communicate it with impact.

Standard Upgrade (MSA4245) \$150

Full (MSA4244) \$297



for non-commercial use only Academic
Our Price **\$97** Save **\$11**
WebCode MSA4243

Microsoft Small Business Server 2003

Access your desktop remotely from any browser - anywhere in the world - 24x7. Collaborate on projects via an auto deployed Windows SharePoint Services site. Best-of-breed email and calendaring solution with Exchange 2003 and Outlook 2003.

SBS 2003 Premium (MSS9705) \$2295



Standard
Our Price **\$985** Save **\$114**
WebCode MSS9700

Microsoft Visual Basic .NET Standard

Reengineered to be a first-class language on the Microsoft .NET Framework, it provides the easiest and most productive route for new developers and existing Visual Basic programmers to quickly build Windows-based applications.

Full (MSA9812) \$165



for non-commercial use only Academic
Our Price **\$87** Save **\$12**
WebCode MSA9811

Microsoft FrontPage 2003

Use enhanced design tools to produce better looking Web sites. Generate better code, or expand your code skills. Use built-in scripting tools for interactive results. And with professional coding tools, you can write code faster, more efficiently, and with greater accuracy. Connect with people and information in new ways by building Extensible Markup Language (XML) data-driven Web sites.

Upgrade (MSA4217) \$170

Full (MSA4216) \$319



for non-commercial use only Academic
Our Price **\$148** Save **\$11**
WebCode MSA4215

Microsoft Visio 2003 Pro

Microsoft Office Visio Professional 2003 includes a full range of diagrams for business and technical professionals to create network and directory service diagrams, software, database, website diagrams, engineering drawings and building space and floor plans.

Pro Upgrade (MSA4242) \$374

Full (MSA4241) \$377



for non-commercial use only Academic
Our Price **\$209** Save **\$36**
WebCode MSA4240

Microsoft SQL Server 2000 Standard

Relational Database Management and Analysis System. Great support for Web standards, powerful tools for system management and tuning, and exceptional scalability and reliability for your money make SQL Server 2000 the best choice for the next generation of enterprise-class database solutions.

Full 5 Client (MSS8209) \$2276

for non-commercial use only Academic 10 Client

Our Price **\$1478** Save **\$119**
WebCode MSS8206



Microsoft Visual C++ .NET Standard

Visual C++ .NET is the most powerful C++ tool for creating the highest-performance software for Windows and the Web. Including features like IntelliSense Technology, Edit and Continue which significantly speeds the development process.

Full (MSA9816) \$165



for non-commercial use only Academic
Our Price **\$87** Save **\$12**
WebCode MSA9815

Price drop on assorted Microsoft Office Suites!

- Office Student & Teacher
- Office Pro Edition full
- Office Pro Academic
- Office Small Business full
- Office Standard full
- Office Standard Upgrade
- Office Pro Upgrade
- Office Small Business Upgrade

Why get MS Office 2003?

Microsoft Office 2003 Editions deliver significant improvements over previous versions of Office, including:

- Advanced e-mail management tools to help you fight back against spam and viruses better than ever before.
- Improved automatic document recovery and compatibility with older files, which mean fewer worries about lost data.
- Brand-new collaboration features to allow you to share work easily and stay connected anytime, anywhere.

MS Office 2003 Editions work best with Windows XP

- If you use Windows XP or Windows 2000, then Office 2003 is the right choice for you.
- If you use Windows 98 or Windows Me, you should consider upgrading to Windows XP.
- If upgrading to Windows XP is not an option for you, then Office XP is the best way to go.

Microsoft Office	Student & Teacher Edition*	Standard Edition	Small Business Edition	Professional Edition
Word	•	•	•	•
Excel	•	•	•	•
PowerPoint	•	•	•	•
Outlook	•	•	•	•
Outlook with Contact Manager				•
Publisher			•	•
Access				•
Enhanced XML Technology				•
Enhanced IRM Technology				•

* For non-commercial use only. Must be a "Qualified Educational User." See Student and Teacher Edition 2003 package for details.

Standard Edition Upgrade	Standard Edition Full	Small Business Upgrade	Small Business Full
Our Price: \$359 Save \$65	Our Price: \$608 Save \$66	Our Price: \$335 Save \$64	Our Price: \$679 Save \$70
WebCode: MSA4221	WebCode: MSA4220	WebCode: MSA4226	WebCode: MSA4225

Student & Teacher Edition*	Pro Edition Academic	Pro Edition Upgrade	Pro Edition Full
Our Price: \$165 Save \$34	Our Price: \$495 Save \$54	Our Price: \$488 Save \$86	Our Price: \$729 Save \$120
WebCode: MSA4237	WebCode: MSA4222	WebCode: MSA4224	WebCode: MSA4223

* For non-commercial use only

Microsoft Windows XP Home with SP2

Designed exclusively for home computing. Whether you're working with digital photos, music, or video, or building a home network, Windows XP innovations bring you into the digital age with ease.

Full (MS59501) **\$285**



Upgrade	
Our Price: \$149 Save \$20	
WebCode: MSA501	

Microsoft Windows XP Professional with SP2

Delivers everything you demand from your computing experience. Whether you're on your own or running a business of any size, optimize your productivity with the digital world's latest innovations.

Full (MS59500) **\$418**

Academic! (MS59501) **\$118**



Upgrade	
Our Price: \$297 Save \$48	
WebCode: MS59502	

Microsoft Plus! SuperPack for Windows XP

Microsoft Plus! SuperPack for Windows XP is loaded with stunning screensavers and themes, exciting games, and great new ideas for customizing photos, music, and home movies. It's a wonderful way to take your Windows experience to the next level.



Upgrade	
Our Price: \$49 Save \$6	
WebCode: MSA5012	

Microsoft Project Standard 2003

Microsoft Office Project Standard 2003 is used by project managers who need a desktop tool to manage their projects independently but who do not require strong coordination with other project managers or the ability to manage resources from a central repository.

Upgrade (MSA2054) **\$255**

Full (MSA2053) **\$919**



Academic*	
Our Price: \$104 Save \$9	
WebCode: MSA2052	

Microsoft Project Professional 2003

The desktop enterprise project management program that is used with MS Office Project Web Access and MS Office Project Server 2003. All the core scheduling tools in Project Standard 2003, plus powerful portfolio and resource management capabilities when connected to Project Server 2003.

Upgrade (MSA2057) **\$925**

Full (MSA2056) **\$1535**



Academic*	
Our Price: \$287 Save \$22	
WebCode: MSA2055	

Windows Server 2003

Windows Server 2003 Standard Edition is the network operating system for small organisations and departmental use. It delivers intelligent file and printer sharing, secure Internet connectivity, centralised desktop application deployment, and Web solutions that connect employees, partners, and customers.

Std 5 Client (MS59867) **\$1540**

Std 10 Client (MS59868) **\$1815**

Enterprise Available. *For non-commercial use only



Std 5 Client Academic*	Std 10 Client Academic*
Our Price: \$685 Save \$85	Our Price: \$835 Save \$64
WebCode: MS59865	WebCode: MS59864

Flight Simulator 2004

A Century of Flight lets you soar through aviation history at the controls of Lindbergh's Spirit of St. Louis, the Douglas DC-3, the Wright Flyer the world's first successful powered aircraft, and other legendary aircraft.



PC	
Our Price: \$77 Save \$22	
WebCode: MSC3011	

Combat Flight Simulator 2

- Veteran World War II pilots from both sides of the Pacific conflict help make every detail - from the roar of engines to radio chatter
- MS graphics technology brilliantly captures classic World War II naval fighters
- From mission briefings to award ceremonies



PC	
Our Price: \$23 Save \$7	
WebCode: MSC3004	

Train Simulator 1

Microsoft Train Simulator brings the power and excitement of some of the world's most famous trains to your PC, placing you in the role of engineer or passenger with unprecedented realism, exciting real-world rail challenges, and the tools to recreate almost any railroad experience in the world.



PC	
Our Price: \$32 Save \$8	
WebCode: MSC3006	

RENT SMART
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Quicken ShareAnalysr V3

Quicken ShareAnalysr is your roadmap to helping you manage your trading strategy. Learn to take control of your financial future and manage your own investment decisions with confidence. Discover how investing in the share market can be fun and extremely rewarding, with the best value analysis software package.



Full Version
Our Price **\$279** Save **\$20**
WebCode...QU10073

Quicken Personal Plus 2005

Quicken Personal Plus 2005 offers everything offered by Personal 2005, with some exciting additional features. As a result Personal Plus 2005 will provide added benefits to some groups of people.

- Easier Investment Account Setup
- Placeholder Entries and Backfill
- Snapshots on Investing Centre
- Average Annual Return

Quicken Personal 2005 (QU10070) \$72



Full Version
Our Price **\$138** Save **\$11**
WebCode...QU10071



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Go to www.csw.com.au/quicken to view red hot Quicken deals and prices!



Go to www.csw.com.au/quicken to view red hot Quicken deals and prices!

QuickBooks EasyStart 2005/06

For the first time QuickBooks user, EasyStart meets the key requirements of small businesses and has been designed with ease of use in mind. You will know how to use EasyStart the moment you launch it, it's that easy!

Track money in and out

Do the work you already do, but faster and more efficiently. Pay your bills, record expenses, track sales and apply payments, all in one place. Look up invoices, transactions, customers and suppliers instantly.

Create invoices and sales receipts

QuickBooks intuitive interface allows you to easily create, and then browse through your sales receipts and invoices. Your sales forms will always look professional with QuickBooks. We know every business is unique, so we have included options that allow you the freedom to customise. To personalise EasyStart to your business simply add your company logo or use the field chooser to select the content that suits you.

Track GST & prepare BAS

QuickBooks EasyStart calculates any GST that you collect or pay, as you enter transactions. When it's time to lodge your Business Activity Statement, simply run a Tax Liability Report and you'll have all the figures you need for the Tax Office.

\$89 cash back on purchases of EasyStart between 6th - 22nd July 2005 via redemption**

QuickBooks Accounting 2005/06

More efficient than spreadsheets, word-processing, or paper ledgers, QuickBooks quickly and easily manages back tasks like printing cheques, paying bills, generating reports, invoicing customers and tracking expenses.

New Features

- Import bank statements into QuickBooks and match transactions easily to reduce data entry*
 - Lodge your BAS online
 - Pay all BAS-related liabilities with a single cheque
 - Drill-Down functionality in the BAS, access help on each field
 - Process credit card transactions directly through QuickBooks**
 - Easier to use Help functionality
 - Tech Support, Product updates & Upgrades for 12 months*
- *Check with your financial institution to see if they support this feature
**Extra charges & terms and conditions may apply
***Normal Advantage terms and conditions apply

Purchase QuickBooks Accounting 2005/06 and receive a bonus Personal Plus 2005 via redemption. Offer ends 31/07/2005**

Full Version
Our Price **\$89** Save **\$10**
WebCode...QU10074



Full Version
Our Price **\$224** Save **\$25**
WebCode...QU10075

QuickBooks Point of Sale 2005/06

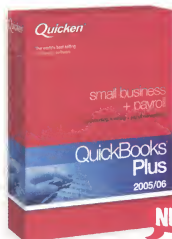
QuickBooks Point of Sale is for the retailer that is looking for a solution that delivers fast sales processing and easy customer management tools. QuickBooks Point of Sale requires QuickBooks Pro, so to complete your store solution use QuickBooks Pro 2005/06, or take advantage of the retail specific edition in QuickBooks Premier 2005/06.

Get over \$800 worth of Point Of Sale Hardware for FREE*



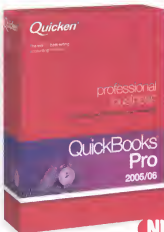
*Hardware offer only available when you purchase QuickBooks Point of Sale together with any one of QuickBooks Pro 2005/06 Full version, QuickBooks Premier 2005/06 Full version or QuickBooks Enterprise V4 and you can get the receipt printer, scanner and cash drawer worth \$800. Offer valid until 14/08/2006 or while stocks last. For full terms and conditions refer to www.quickbooks.com.au/promotions. Allow up to 30 business days for the products to be sent out. Images for illustration purposes only. Extra fees/charges may apply for using the EFTPOS functionality.

Full Version
Our Price **\$448** Save **\$51**
WebCode...QU10086



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QuickBooks Plus 2005/06

Gives you easy-to-use tools and the latest tax tables you need to help manage and maintain control of your payroll. The integrated payroll feature saves you time and money by avoiding duplicate data entry and helps to avoid hassles associated with incorrect payroll withholding.

New Features

- Import bank statements into QuickBooks and match transactions easily*
- Process credit card transactions directly through QuickBooks**
- Lodge your BAS online
- Pay all BAS-related liabilities with a single cheque
- Pay employees into multiple bank accounts
- Half-monthly pay periods
- Easier to use Help functionality
- Email Payslips, Payment Summaries and Employee Super Notifications.
- Tech Support, Product Updates & Upgrades for 12 months on Full and Upgrade versions of QuickBooks Plus 2005/06*.

*Check with your financial institution to see if they support the feature
**Extra charges & terms and conditions may apply
*Normal Advantage terms and conditions apply

Purchase QuickBooks Plus 2005/06 Full version and receive a bonus Lexmark X4270 via redemption. Offer ends 31/07/2005**

**Terms & Conditions at www.quicken.com.au/promotions/

Subscription	Save	Upgrade Version	Save	Full Version	Save
Our Price \$179	\$20	Our Price \$305	\$44	Our Price \$429	\$70
WebCode: QUI0082		WebCode: QUI0079		WebCode: QUI0076	



QuickBooks Pro 2005/06

Save your business undue costs by utilising QuickBooks email functionality. Invoices, statements, estimates, purchase orders, sales orders, sales receipts, adjustment notes, and reports can all arrive on your suppliers or customers desktop within minutes.

New Features

- Import bank statements into QuickBooks and match transactions easily*
- Run a report to display a list of all transactions without tax codes
- Process credit card transactions directly through QuickBooks**
- Lodge your BAS online
- Pay all BAS-related liabilities with a single cheque
- Pay employees into multiple bank accounts
- Half-monthly pay periods
- Email Payslips, Payment Summaries & Employee Super Notifications
- Tech Support, Product Updates & Upgrades for 12 months on Full and Upgrade versions of QuickBooks Pro 2005/06*.

*Check with your financial institution to see if they support this feature
**Extra charges & terms and conditions may apply
*Normal Advantage terms and conditions apply

Purchase QuickBooks Pro 2005/06 Full version and receive a bonus Lexmark X6170 via redemption. Offer ends 31/07/2005**

**Terms & Conditions at www.quicken.com.au/promotions/

Subscription	Save	Upgrade Version	Save	Full Version	Save
Our Price \$224	\$25	Our Price \$395	\$64	Our Price \$589	\$110
WebCode: QUI0083		WebCode: QUI0080		WebCode: QUI0077	



QuickBooks Premier 2005/06 - 5 User Licence

QuickBooks is available in industry-specific editions that offer specialised tools and features unique to your industry. Whether you're an Accountant, Contractor, Manufacturer, Not-for-Profit, Professional, Retailer, or Property Manager there is a specific QuickBooks version for you. QuickBooks Premier allows up to 5 users.

New Features

- Import bank statements into QuickBooks and match transactions easily*
- Run a report to display a list of all transactions without tax codes
- Process credit card transactions directly through QuickBooks**
- Pay all BAS-related liabilities with a single cheque
- Pay employees into multiple bank accounts
- Half-monthly pay periods
- Email Payslips, Payment Summaries & Employee Super Notifications
- Tech Support, Product Updates & Upgrades for 12 months on Full and Upgrade versions of QuickBooks Premier 2005/06*.

*Check with your financial institution to see if they support the feature
**Extra charges & terms and conditions may apply
*Normal Advantage terms and conditions apply

Purchase QuickBooks Premier 2005/06 Full version and receive a bonus Lexmark X215 via redemption. Offer ends 31/07/2005**

**Terms & Conditions at www.quicken.com.au/promotions/

Subscription	Save	Upgrade Version	Save	Full Version	Save
Our Price \$449	\$50	Our Price \$620	\$120	Our Price \$1428	\$271
WebCode: QUI0084		WebCode: QUI0081		WebCode: QUI0078	



QuickBooks Customer Manager

Customer Manager is a new information and task management tool that will help you better serve your customers. It takes the pain out of tracking customer information in multiple systems because it consolidates all your client's critical information in one place and displays it on one, simple screen.

- Centralise all your customer data into one system
- Enhances customer service
- Simple to get started
- Manage projects efficiently
- Multi user synchronisation



Full Version	Save
Our Price \$220	\$29
WebCode: QUI0066	

Payroll Premier 2005/06

Payroll Premier makes payroll "Quicken easy" giving you more time to manage your business. The best selling stand alone payroll software in Australia is designed to keep you up to date, compliant with the latest legislation, and grows as your business needs to grow.

- New single page summary form
- Enhanced search functionality
- Automated check of Tax File Numbers



Full Version	Save
Our Price \$529	\$70
WebCode: QUI0087	

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MYOB JustInvoices

If you're looking for a better way to prepare your invoices, track your sales and calculate GST received, but you're not after a complete business management system, MYOB JustInvoices is just what you need.



Our Price \$66 **Save \$13**
WebCode MYB0027

MYOB BusinessBasics

No need to jump between programs (such as spreadsheets and word processors) to get your business done. Now with MYOB BusinessBasics, you can run all your basic business tasks, create quotes, email invoices and enter transactions - from the one easy business program.



Our Price \$88 **Save \$11**
WebCode MYB0004

MYOB Test Drive

MYOB Test Drive allows you to try Australia's leading business software. With up to 90 days use of MYOB's seven leading products including the Macintosh range, trial Australia's number one range today.



Our Price \$9 **Save \$1**
WebCode MYB0047

MYOB Accounting Plus 15

MYOB Accounting Plus helps you manage both your business and payroll with ease.

It's packed with the same business management features that you'll find in MYOB Accounting, plus it automates your pay runs, calculates PAYG withholdings, works out the super and then updates all your accounts automatically. Easy! If you bill clients for your time, MYOB Accounting Plus can help you and your team to track every minute and every task performed for them. It's easy to see what needs to be billed and how your employees are spending their time - you won't miss a thing.

- Process pays weekly, fortnightly, twice a month or monthly - or in any combination of those.
- Pay employees based on the time recorded on their activity slips.
- Quickly report on all obligations - PAYG withholdings, superannuation, leave, union fees.
- Includes the PAYG withholding tax tables for 2004/2005. Includes automatic update to the 2005/2006 tax tables when available.

* Full redemption from MYOB. Offer applies to full version only. Bonus Phone ends 31/7/05.

Super Choice ready!

MYOB Accounting 15

MYOB Accounting is for businesses that need to streamline accounts procedures and would benefit from improved inventory management, better management of customer and supplier relationships and advanced business reporting.

- Manage your sales, receivables and GST obligations
- Track your purchases and payables
- Keep track of your inventory
- Access M-Powered Services

* Full redemption from MYOB. Offer applies to full version only. Bonus Phone ends 31/7/05.

Our Price \$230 **Save \$69**
WebCode MYB0042

Our Price \$220 **Save \$19**
WebCode MYB0044

MYOB FirstEdge - for Mac

MYOB FirstEdge is the easy business and accounting software for small or home-based business on the Mac. Run all your basic management tasks from the one easy business program. MYOB FirstEdge simplifies the way you quote, track and invoice your jobs, simultaneously tracking your transactions and GST, and providing you with over 70 reports to help you understand your business.

- Create quotes that convert to invoices
- Track job costs and profitability
- Email quotes, invoices and reports
- Automatically reconcile your accounts



Our Price \$88 **Save \$11**
WebCode MYB0005

MYOB RetailManager 8

Replace your cash register with MYOB RetailManager, a complete point-of-sale system that streamlines store operations and helps you better manage sales, stock, GST, staff and customers.

You can operate MYOB RetailManager on its own, add licences, and combine it with MYOB RetailManager Enterprise to provide centralised management of multiple point-of-sale or store locations.

Includes 12 months of 7-days-a-week Enhancements & Support



Our Price \$1649 **Save \$341**
WebCode MYB0005

NEW

BONUS* Uniden Phone & Headset
RRP \$168

Full Version
Our Price \$459 **Save \$136**
WebCode MYB0043

Upgrade Version
Our Price \$249 **Save \$50**
WebCode MYB0045

MYOB Premier 9

MYOB Premier is a multi-user business management software with integrated payroll, inventory, time billing and multiple currency transaction capability.

- Multiple users can access information simultaneously over your network
- Integrated banking, sales, purchases, payroll and time billing

BONUS* Uniden Phones & MS Desktop
RRP \$448

* Full redemption from MYOB. Offer applies to full version only. Bonus Phone ends 31/7/05.

Includes 12 months of FREE Upgrades and Support.
Super Choice ready!

Our Price \$1245 **Save \$250**
WebCode MYB0048

MYOB AccountEdge 5 - for Mac

MYOB AccountEdge is issued with a single user licence and with unlimited additional licences available. MYOB AccountEdge gives you the power to manage even the most complex medium-sized business, with a powerful multiple pricing level inventory, multiple currency transaction functionality, integrated payroll, and more.

- Track your inventory and your money
- Process your payroll
- Track your billable time
- Maintain accurate accounts
- Process sales and purchases
- Setup and manage promotions

Super Choice ready!



Our Price \$532 **Save \$63**
WebCode MYB0007

MYOB RetailReady

Whilst a cash register can do the job, it has its limitations. MYOB RetailReady Point Of Sale software and Posiflex hardware, on the other hand, can turn a standard PC into a powerful EASY solution.

MYOB RetailReady enables you to:

- Search for stock and maintain stock items
- Analyse what's selling, what's not and GST collected
- Manage Lay-bys and process refunds
- Collect and analyse customer information
- Track credit card surcharges
- Export to most MYOB business software products



Our Price \$769 **Save \$130**
WebCode MYB0040

FileMaker Pro 7

FileMaker Pro 7 is the easiest-to-use, most customisable database software that effortlessly manages all your information. Gain insights into your business so you can make more informed decisions and enhance productivity. With over 100 new and improved features, you can turn your ideas into creative and customised solutions, tailor them to solve your specific business problems and share them securely with your whole workgroup.

- Organise all your data: PDFs, images, video, presentations, Excel and Word documents.
- Develop document management systems to track and archive workgroup data.
- Solve problems immediately with 30 free starter solutions for business, education and home.
- Create fully relational database solutions quickly.
- Link your data with the new intuitive relationships graph.
- Exchange data with Microsoft Office and many other applications.
- Develop and distribute secure business solutions over your networks or through single-click Web publishing.
- Control access through a unified accounts and privileges security model.



Creating a Database in FileMaker: vopc

Smart, focused, full-colour guide is the complete package for users who want to create their first Filemaker Pro database - now!



Academic	Upgrade	Full
Our Price \$239 Save \$10	Our Price \$275 Save \$24	Our Price \$445 Save \$54
WebCode... FLD0135	WebCode... FLD0134	WebCode... FLD0133

Book-Paperback
Our Price \$19 Save \$14
WebCode... CGN0072

Buy More, Save More

Buy a VLA that includes at least 10 units of FileMaker Pro 7 and you can add a FREE copy of FileMaker Developer 7. PLUS, you have the option to add one copy of FileMaker Server 7 or one copy of FileMaker Server 7 Advanced at a huge 50% off the normal price! This offer is valid between 27 March 2005 and 24 September 2005, for further details go to <http://www.filemaker.com.au/promos/vla.html>.

Buy 4 copies of FileMaker Pro 7 and get a 5th copy for free!

The ideal solution for small businesses, workgroups, or departments. This product is designed to start off your workgroup of 5 or more users (1 manual and 1 CD are included in the 5 Pack), and provides a flexible way to grow with your workgroup.

Customers will receive a FileMaker Pro 7 five pack which contains one CD and five separate codes. Promotion starts 28 March 2005 and finishes 23 September 2005. Eligible SKUs include 5-pack Retail, 5-pack Upgrade and 5-pack EduGovt. For more information go to: <http://www.filemaker.com.au/promos/>

MoneyWorks Gold

MoneyWorks Gold is the comprehensive accounting solution for businesses with a requirement for flexible reporting, departmental accounting, inventory, job costing and/or multi-user networking. Designed for Filemaker!



FileMaker Developer 7 FREE!



Buy a 5-License pack of FileMaker Pro 7 for the price of 4-licenses

Want to take advantage of these fantastic offers?
Call City Software Managed Accounts on 1300 761 761

FileMaker Developer 7

An enhanced version of FileMaker Pro with integrated developer tools and utilities to help you build better databases faster. With new features, including custom functions and file maintenance tools and enhancements to the Database Design Report, script debugger and customisation options

- Streamline database development and maintenance
- Develop and troubleshoot solutions more effectively
- Deploy more customised solutions



Our Price	Save
\$830	\$45
WebCode... FLD0139	

FileMaker Server 7

New server software is easier to use, faster and more secure with virtually unlimited data hosting capacity. This high performance server software that efficiently manages shared database solutions, enables you to; share databases with up to 250 users; improve the performance of shared databases; host virtually unlimited amounts of data; administer databases centrally or remotely; and protect your data with advanced security features.

Upgrade
 (FLD143) **\$849**
 Academic
 (FLD144) **\$875**



Our Price	Save
\$1650	\$99
WebCode... FLD0142	

FileMaker Server 7 Advanced

FileMaker Server 7 Advanced is an enhanced version of FileMaker Server 7 that includes powerful web publishing and connectivity options. Using robust server connectivity options and the new powerful features you can:

- Share and integrate solutions over the web
- Host massive amounts of data
- Easily configure and maintain your database



Our Price	Save
\$4199	\$190
WebCode... FLD0145	

Centennial Media Training for FileMaker Pro 7

Providing thorough and comprehensive training into the principles and features of FileMaker Pro 7. Proceed step by step with easy to understand methods and techniques.

Basic (CEN0054) **\$188**



Intermediate
Our Price \$188 Save \$10
WebCode... CEN0055

Borland Delphi 2005 Enterprise

With Delphi, C#, Microsoft .NET Framework and Win32 support for GUI, Web, database, and ALM in one hyperproductive RAD environment, every Windows development task is easier, better, and faster. Delphi 2005 is all the power of Delphi and more for Microsoft .NET and Win32.

Architect (BOR0123) \$5035
Professional (BOR0119) \$1579

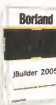


Our Price **\$3595** Save **\$209**
WebCode...BOR0121

Borland JBuilder 2005 Enterprise

JBuilder 2005 Enterprise simplifies Web and Enterprise JavaBeans development with two-way visual designers and rapid deployment to J2EE application servers. Power productivity with innovative JavaServer Faces, Struts, and Web Services designers, distributed refactoring, and integrated performance tools.

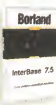
Developer (BOR0127) \$720



Our Price **\$5050** Save **\$297**
WebCode...BOR0125

Borland InterBase 7.5

A high-performance, cross-platform, embeddable database that provides multiprocessor support. Easy installation, automatic crash recovery, and minimal maintenance.



Contact CSW Managed Accounts on 1300 761 761 for more information

Crystal Reports XI

Creating and delivering information for extreme business insight

New Crystal Reports® XI is designed to increase productivity and reduce the time spent designing, managing and delivering reports via the web. New features enable you and your end users to experience high quality viewing, printing, and exporting with less effort. These new features include an enhanced designer to speed up data access and formatting, dynamic cascading prompts to minimize report maintenance, and the editable RTF format to easily modify reports in standard word processing applications.

Access and present any data the way you want

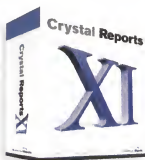
- Flexible and unconstrained database connectivity
- Visually understand complex information with highly formatted reports
- Automated wizards and reusable templates speed report production

Deliver the right information to the right people at the right time

- Real-time and scheduled reports delivered when and where you need them
- Scalable and reliable reporting services for speed of thought information access
- Personalized reports for interactive exploration

Universal integration with applications and portals

- Extensive SDKs to view, print, export and modify reports within an application
- Support for leading web application servers and platforms
- Pre-built portal integration kits for quick deployment



Standard Edition	Professional Edition	Professional Upgrade	Developer Edition	Developer Upgrade
Our Price \$237 Save \$74	Our Price \$598 Save \$191	Our Price \$312 Save \$94	Our Price \$720 Save \$229	Our Price \$390 Save \$112
WebCode...SCR0334	WebCode...SCR0332	WebCode...SCR0333	WebCode...SCR0324	WebCode...SCR0325

Crystal Reports Server XI

Crystal Reports Server is a complete reporting solution that helps small and medium-sized businesses create, manage, and deliver reports - via the web or embedded in enterprise applications.

It addresses all steps in the reporting process - from data access and report design, to report management and delivery, to report integration with portals and applications. Plus, it includes Crystal Reports XI, the world standard for report creation, making it easy for existing or new Crystal reports to be shared over the web.

One year of technical support and maintenance is also included for rapid deployment and peace of mind.

Crystal Reports Server includes Crystal Reports XI Professional for report design, and comes with a 5 concurrent user access license.

Contact CSW Managed Accounts today to discuss your needs on 1300 761 761.



Dantz Retrospect 7 Professional

Designed for homes and home offices, Retrospect Professional protects a single Windows desktop or notebook, or a small network of Windows, Macintosh, and Linux desktops and notebooks. Automated technology delivers fast backups and smart restores with unparalleled accuracy. Retrospect Professional is easy to use, enabling you get your first backup running in less than ten minutes.

Dantz Retrospect 7 Disk to Disk (DAN0016) \$445

Dantz Retrospect 7 Single Server (DAN0013) \$1045



Our Price **\$199** Save **\$10**
WebCode...DAN0012

Dantz Retrospect 7 Small Business Server Standard

Retrospect Small Business Server Standard is designed for a business with a server running Windows Small Business Server Standard edition. It provides licenses to protect the server plus networked desktops and notebooks. Licenses can be purchased to protect additional networked servers.

Dantz Retrospect 7 Small Business Server Premium (DAN0015) \$1112

Dantz Retrospect 7 Multi Server (DAN0017) \$1949



Our Price **\$737** Save **\$68**
WebCode...DAN0014

ACT! 7 Retail

Make contact. Build relationships. Get results.

- Organise your data for quick and easy access
- Manage and grow your business relationships
- Link to your Palm OS® or Pocket PC handheld device
- Stay on top of your schedule 24/7
- Forecast and track sales opportunities
- Works with Microsoft® Outlook®

Academic (ACT7007) \$146

Upgrade (ACT7001) \$154



Full
Our Price **\$263** Save **\$36**
WebCode...ACT7000

The Internet, controlled.

getbusi is the easiest way to keep your organisation's Internet usage work focused.

- You decide who gets priority speed web access
- You decide which websites can and cannot be viewed
- You decide who can and cannot access the web

getbusi combines powerful bandwidth management, content filtering, and monitoring and reporting with an easy to use browser based interface. All designed to seamlessly integrate with your existing office network.



getbusi
web access management

Contact CSW Managed Accounts on 1300 761 761 for more information

0-25 User	26-100 User	101-300 User
Our Price \$2992 Save \$187	Our Price \$4672 Save \$295	Our Price \$7673 Save \$480
WebCode...GET0001	WebCode...GET0002	WebCode...GET0003

Norton Internet Security Solutions - Secure & Protect!



Key Features:

Which is right for you? Use this handy table to compare our Internet Security solutions.

- Removes viruses, worms, and Trojan horses automatically
- Scans and cleans email and instant messages of viruses
- Detects certain non-virus threats such as spyware
- Blocks Internet worms at the point of entry
- Detects viruses in compressed file archives in real-time
- Filters out spam email
- Blocks email in selected languages
- Detects offensive email
- Blocks banner ads and pop-ups
- Hides your computer from hackers
- Blocks online intrusions
- Protects your personal information on the Internet
- Blocks inappropriate or distracting Web sites
- Automatically detects and removes both spyware and adware
- Notifies you about high-level Internet threats
- Downloads new protection updates automatically

	Norton AntiVirus 2005	Norton AntiSpam 2005	Norton Personal Firewall 2005	Norton Internet Security 2005	Norton Internet Sec. AntiSpyware Edition 2005
Single User (SYM5585) \$77	Single User (SYM8454) \$68	Single User (SYM8495) \$81	Single User (SYM8496) \$99	Single User (SYM9629) \$119	
Removes viruses, worms, and Trojan horses automatically	•			•	
Scans and cleans email and instant messages of viruses	•			•	
Detects certain non-virus threats such as spyware				•	
Blocks Internet worms at the point of entry	•			•	
Detects viruses in compressed file archives in real-time	•			•	
Filters out spam email		•		•	
Blocks email in selected languages		•		•	
Detects offensive email		•		•	
Blocks banner ads and pop-ups		•	•	•	
Hides your computer from hackers			•	•	
Blocks online intrusions			•	•	
Protects your personal information on the Internet			•	•	
Blocks inappropriate or distracting Web sites			•	•	
Automatically detects and removes both spyware and adware			•	•	
Notifies you about high-level Internet threats			•	•	
Downloads new protection updates automatically	•	•	•	•	•
3 Pack (SYM5511) \$121	5 Pack (SYM5514) \$158	5 Pack (SYM8405) \$187	3 Pack (SYM5512) \$178	Academic (SYM5137) \$79	
5 Pack (SYM5587) \$179	10 Pack (SYM5522) \$252	10 Pack (SYM5523) \$319	5 Pack (SYM5614) \$272		
10 Pack (SYM5588) \$307	Academic (SYM5118) \$47	Academic (SYM5123) \$55	Academic (SYM5121) \$73		
Academic (SYM5130) \$55					

Looking for the latest licensing options? Speak to our managed accounts team on 1300 761 761

Symantec Norton GoBack 4

Restore your PC to a healthy state by going back minutes, hours, or even days (depending on available disk space). Or you can use it to recover individual files and folders, such as accidentally deleted files and previous versions of documents. The new Safety Mode makes it easy to recover from problematic software installations.

Academic (SYM5117) \$44

Protect Your Data!



Our Price \$64 **Save \$15**

WebCode: SYMB519

Symantec Norton Ghost 9.0

Symantec's Norton Ghost 9.0 provides advanced backup and recovery for your PC. Protect your data by making a backup of your hard drive's contents - without restarting Windows. Incremental backups save you time and disk space. You can even schedule backups to run automatically. Quickly restore individual files, selected folders, or the entire hard drive.

Academic (SYM5116) \$78



Our Price \$118 **Save \$31**

WebCode: SYMB517

Norton SystemWorks 2005 Premier 5 User

Symantec's Norton SystemWorks 2005 Premier gives you powerful tools to solve PC problems and eliminate data. This easy-to-use suite helps you eliminate viruses, back up your files, and prevent computer problems. A new recovery disk allows you to recover data even when Windows won't start up.

10 User Pack (SYM524) \$448

Includes Norton Ghost 5 Users



Our Price \$298 **Save \$81**

WebCode: SYMB404

Symantec pcAnywhere 11.5 Host & Remote

Combines secure, industry-leading remote control with remote management and advanced file transfer to help IT personnel quickly resolve helpdesk and server support problems. Offers comprehensive security, including support for 13 authentication types, including RSA SecurID.

Academic (SYM5133) \$160
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Leading remote control solution!



Host & Remote
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Norton Partition Magic 8

Symantec's Norton Partition Magic 8.0 lets you easily organise your hard drive by creating, resizing, copying, and merging disk partitions. Separate your operating system, applications, documents, music, photos, games, and backup files to reduce the risk of data loss if your system crashes. You can use Norton Partition Magic 8.0 to run multiple operating systems safely.

Academic (SYM5111) \$66

Easily organise your hard drive.



Our Price \$95 **Save \$24**

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WebCode... MAU008

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Vet Net Surfer Anti-Virus

Don't leave virus protection to chance - purchase Vet Net Surfer now to automatically protect your PC from viruses, worms and trojans, including those arriving via email. All the anti-virus you need.

eTrust PestPatrol Anti-Spyware

eTrust PestPatrol Anti-Spyware detects and removes a wide variety of spyware to protect your PC from unauthorised access, information theft and diminished system performance. Spyware, adware and other threats are rapidly spreading, and represent a major security and privacy risk. eTrust PestPatrol reduces this risk and provides an added layer of protection for safe Internet connectivity.



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*Valid only with purchase of eTrust Anti-Virus and eTrust PestPatrol based software bundle between 6 June 2005 and 31 August 2005. Rebate offer is only valid for purchases in Australia to a total sum of \$30.00. See box for more details.

eTrust Firewall Personal Edition

Computer Associates International, Inc. (CA)'s eTrust Firewall provides complete industrial-strength hacker and privacy protection.

eTrust Firewall protects your PC from both known and unknown threats, with an easy-to-use interface and pre-loaded settings that take the guesswork out of security.

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- Automatic network detection helps ensure the right level of security.



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WebCode... ADA7539

Roxio Toast 6 Titanium

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WebCode... MER0003



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- Instant DVD Recorder
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- Instant Disc
- Instant Backup



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Full \$892



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WebCode ULE0073

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WebCode SON0018

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Symantec Norton AntiVirus 10 for Mac

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Symantec Norton SystemWorks 3 for Mac

Symantec's Norton SystemWorks 3.0 for Macintosh is the smartest way to solve computer problems. Norton AntiVirus 9.0 for Macintosh, the world's most trusted antivirus solution for Macintosh systems, removes viruses automatically—without interrupting your work.

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Norton™ Personal Firewall blocks hackers. Norton™ Privacy Control keeps confidential information safe. Norton AntiSpam™ filters out unwanted email. And Norton™ Parental Control blocks access to inappropriate Web sites. Get all-in-one protection against today's most dangerous online threats with Norton Internet Security AntiSpyware Edition.

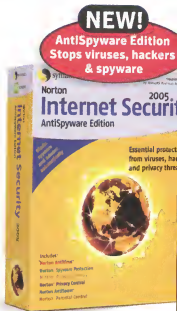
* Top-selling antivirus software product from December 2000 through February 2005 based on The NPD Group's retail Top Selling Business Software list.

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Symantec AntiVirus 10.0

10 User With Groupware

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• 1Mb/345k	1GB	\$99.95
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• 512/128k	1GB	\$59.95
• 1MB/345k	1GB	\$64.95
• 1MB/345k	3GB	\$79.95
• 1MB/345k	10GB	\$189.95



* Actual Speed may vary depending on a number of factors including but not limited to coverage areas

** Download amounts are monthly included amounts. Having reached limit, connection will be shaped to 64Kbps. Option available to pay 12c incl GST per excess MB downloads.

Price is a monthly charge and is inclusive of GST

What is Chilli iBurst mobile broadband?

iBurst is a broadband internet service that is as mobile as your mobile phone. For professionals and home users that don't want to be constrained by a fixed line broadband or troublesome installation process. By removing the physical limitations of conventional broadband solutions the Chilli iBurst solution gives individuals the freedom to send emails, share files over the internet, surf the web and even make phone calls whenever and wherever they want. It also represents significant cost savings in no longer having to pay monthly phone line rental!

How do I confirm my area is covered?

iBurst is currently available in Sydney, Melbourne, Brisbane, Canberra and the Gold Coast with coverage expanding every week. To check whether your specific area has coverage please go to iBurstCoverage.chilli.net.au or call Chilli on 1300 655 554.

Every Chilli iBurst package comes with:

- Full 30 Day Money Back guarantee & 12 Month Warranty on Hardware
- 3 email addresses
- 5MB of personal web space



Purchase this desktop modem & sign up to Chilli iBurst Desktop plan on:

1. 6 month contract & receive 1 month free (worth up to \$189.95)
2. 12 month contract & receive 2 months free (worth up to \$248)

* Offer valid from 1st July until 31st July 2005. See <http://iburst.ht.com.au> for terms & conditions and redemption instructions. Postage extra.

Purchase this laptop modem with any laptop & get \$100 cashback²

Offer valid from 1st July to 31st July 2005. Requires sign up to Chilli iBurst Desktop plan. See <http://iburst.ht.com.au> for terms & conditions and redemption instructions. Postage extra. Redemption forms to be received by mail by 5pm AEST 30th September 2005. Limit of one cashback claim per laptop purchase.



\$299
S0247

NEW FINANCIAL YEAR SPECIAL AND PORTÉGÉ SERIES

20th
AnniversaryToshiba
Portable PC
Since 1985TDP-TW90 WIRELESS
PROJECTORBONUS
ITEMS
by redemption

Toshiba's TDP-TW90 Projector is versatile, with all the features and functionality you would expect from a high performance machine.

The TDP-TW90 has XGA resolution, 2200 ANSI Lumen and 2000:1 contrast ratio and features an extensive range terminal inputs, 2 x VGA PC inputs, 1 x VGA out, RCA & S-Video in, Audio in and out. Backed by Toshiba's 3 year warranty.

The TDP-TW90 also has built in 802.11b wireless connectivity for up to 4 PCs, and can work in ad hoc or network mode.

Rent* \$37.23/wk

R4045

\$3,574

*PROMOTION:

Redeem a bonus table top projection screen and 4-in-1 card reader via Toshiba by emailing your invoice number to lsales@toshiba-tap.com. Offer available until 31/07/05.

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

KICK OFF YOUR NEW FINANCIAL YEAR WITH THIS GREAT BUNDLE

TOSHIBA TECRA A3

- Intel Pentium M 730 1.6GHz processor
- 256MB DDR RAM
- 40GB* hard drive
- 15" XGA TFT screen
- DVD SuperMulti optical drive
- 56k V.92 modem & 10/100 LAN
- Wireless LAN 802.11a/b/g WiFi
- 1 x Type II PCMCIA
- Weighs 2.7kg
- Microsoft XP Professional
- 1 year warranty
- Available only while stocks last



Belkin wireless mouse



Kingston 256MB USB Key



Targus carry bag

FOUR
GREAT
BONUS
ITEMS!

Belkin wireless keyboard

Rent* \$22.18



M7414

PORTÉGÉ SERIES

COMPACT AND LIGHT WITH 3 YEAR WARRANTY

Ready to work when and where you are, the Portégé series delivers an advanced combination of ultra-portability and expansion capability. Behind the compact design lies a power base ready to maximise performance with Intel Pentium M processors, large memory, and built in wireless communication to keep you well connected wherever your business takes you. These functions combine to ensure your investment is well protected.



R200

Ultra light
(1.3kg) and
ruggedised*

PORTÉGÉ	R200	M300	M200 TABL
MOBILE PENTIUM M	753 ULV 1.2GHz	753 ULV 1.2GHz	725 1.6G
RAM STD	2 x 256MB	2 x 256MB	512M
HARD DRIVE	60GB*	60GB*	80G
SCREEN	12.1" XGA	12.1" XGA	12.1" SXGA
56K V.90 & 10/100 LAN	Yes	Yes	Yes
WIRELESS LAN	WiFi b/g	WiFi a/g & BT	WiFi b
OPTICAL DRIVE	No	DVD SuperMulti	M
WEIGHT	From 1.3kg	From 1.6kg	2.1k
OP SYSTEM	XP Pro	XP Pro	XP Tabl
RENT*	\$36.45/wk	\$37.45/wk	\$46.14/wk
PART NUMBER	S1808	S0528	Q951
PRICE	\$3,499	\$3,595	\$3,950

*Accessible capacity of hard drive may be less due to pre-installed software and recovery partition

TOSHIBA

harristechnology



Notebooks

TECRA A3 & A4 SERIES

TECRA A3

Featuring the latest Mobile Intel Pentium M or Intel Celeron M processors with a standard battery life of up to 4 hours, all models in the series offer high levels of performance and reliability. Helping to maximise productivity is the full range of expansion and connectivity features including PC Card slot, three USB 2.0 ports, an international V.92 modem and a 10/100 Mbit Ethernet LAN port.

Optional Port Replicator for the A3 Tecra notebook range available.



**BONUS
CARRY BAG
&
256MB RAM
(not installed)**



TECRA	A3	A3 ²	A3
PROCESSOR	Cel-M 370 1.5GHz	P-M 730 1.6GHz	P-M 740 1.7GHz
RAM STD	256MB	256MB	512MB
HARD DRIVE	40GB*	40GB*	60GB*
SCREEN	15" XGA TFT	15" XGA TFT	15" XGA TFT
OPTICAL DRIVE	DVD/CD-RW	DVD-SuperMulti	DVD-SuperMulti
V.92 & 10/100 LAN	Yes	Yes	Yes
WIRELESS LAN	WiFi Antenna	WiFi a/b/g	WiFi a/b/g
WARRANTY	1 year	1 year	1 year
OPERATING SYSTEM	XP Pro	XP Pro	XP Pro
PRICE*	\$17.87/wk	\$22.91/wk	\$27.26/wk
PRODUCT NUMBER	34253	34258	34259
PRICE	\$1,595	\$1,979	\$2,365

SEE PAGE 4 FOR THE TOSHIBA TECRA A3 "NEW FINANCIAL YEAR KICK OFF NOTEBOOK" OFFER.

TECRA A4

For business professionals the perennial question remains "your business or your life"? Why not enjoy both with the Tecra A4 Notebook PC series from Toshiba. You'll work smarter and faster than ever before with its full array of performance features. Then enjoy its reliable mobility to take it to the office and more of your family and friends. And all at a price that helps balance the books as well. Includes Centrino mobile technology.



TECRA	A4	A4
MOBILE PENTIUM M	740 1.7GHz	750 1.8GHz
RAM STD	512MB	512MB
HARD DRIVE	60GB*	80GB*
SCREEN	15.4" WXGA TFT (CSV)	15.4" WSXGA+ TFT
VIDEO RAM	Shared	128MB Dedicated
OPTICAL DRIVE	DVD SuperMulti + DL	DVD SuperMulti + DL
WIRELESS LAN	WiFi a/b/g	WiFi a/b/g & BT
WARRANTY	1 year	1 year
OPERATING SYSTEM	XP Pro	XP Pro
PRICE*	\$35.44/wk	\$49.32/wk
PRODUCT NUMBER	34260	S5155
PRICE	\$2,475	\$2,749

*Possible capacity of hard drive may be less due to pre-installed software and recovery partition.



TDP-SW25 WIRELESS PROJECTOR

**BONUS
ITEMS**

by redemption
See page 4



Toshiba's TDP-SW25 Projector features an integrated WLAN function plus all necessary software for wireless presentation. With excellent picture quality in video and data mode, this 1800 ANSI Lumens projector is the perfect solution for presentations.

- Brightness: 1,800 ANSI-lumens
- Contrast Ratio: 2,000:1
- Resolution: SVGA 800 x 600
- Wireless communication: WiFi 802.11 b/g
- 3 year warranty & 90 day new product replacement warranty

Rent* \$24.29/wk

S3216

\$2,274

²Bonus offer only available while stocks last. Not available in conjunction with any other offer.

*RENTSMART

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PLEASE NOTE:

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TOSHIBA

TECRA M3 & S2 SERIES

20th
AnniversaryToshiba
Portable PC
Since 1985TECRA M4
TABLET PC

The M4 is a versatile and convertible Notebook for business professionals who won't compromise on the consistency, reliability and longevity of their business machines. Now executives can create data and browse information using natural pen-based input, saving precious time and protecting valuable intellectual property.

- Intel Pentium M 770 2.1GHz
- 2 x 512MB DDRII RAM
- 80GB* (5400 rpm) HDD
- 14.1" SXGA+ TFT (1400 x 1050)
- nVidia GeForce 6200 Go with 128MB Video RAM
- DVD SuperMulti + DL Drive
- 56K modem & Gigabit LAN
- WiFi a/b/g
- Weighs 2.8kg
- Microsoft OneNote and Windows XP Tablet Edition

Rent* \$45.68/wk
\$4,950

S2872

[^] Limited stock: Offer available only while stocks last. Not available in conjunction with any other offer.

***RENTSMART**

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TECRA M3

The Tecra M3 delivers a balance of portability, hardware and software image stability with high performance. The magnesium alloy chassis provides added durability whilst making it the lightest in its class. Combined with extended battery life (with optional high capacity and internal SelectBay battery), this makes the Tecra M3 the ideal road ready business notebook. Featuring Intel Pentium M Processors, a choice of DVD/CD-RW or DVD SuperMulti optical disk drive, Gigabit Ethernet, Firewire and Bluetooth options. The M3 provides a foundation to significantly boost business productivity.



MODEL	TECRA M3	TECRA M3	TECRA M3	TECRA M3
MOBILE PENTIUM M	730 1.6GHz	740 1.7GHz	750 1.8GHz	760 2.0GHz
RAM STD (DDR II)	512MB	512MB	512MB	2 x 512MB
HARD DRIVE	40GB*	60GB*	60GB*	80GB*
SCREEN	14" XGA TFT	14" XGA TFT	14" XGA TFT	14" SXGA+
VIDEO RAM	64MB	64MB	128MB	128MB
OPTICAL DRIVE	DVD/CD-RW	DVD SuperMulti	DVD SuperMulti	DVD SuperMulti
WIRELESS LAN	Upgradable	WiFi a/b/g	WiFi a/b/g	WiFi a/b/g
WARRANTY	1 year	1 year	1 year	1 year
OP SYSTEM	XP Pro	XP Pro	XP Pro	XP Pro
RENT*	\$28.72/wk	\$32.89/wk	\$37.36/wk	\$41.00/wk
PART NUMBER	R3721	R3722	R3723	R3724
PRICE	\$2,695	\$3,079	\$3,395	\$4,099

TECRA S2

The Toshiba Tecra S2 delivers outstanding performance and seamless wireless connectivity to business computing. Now free to perform at their best wherever business takes them, executives will appreciate the added mobile productivity of the Tecra S2 with up to 4.5 hours of battery life. Includes modem and LAN capabilities.



MODEL	TECRA S2	TECRA S2	TECRA S2
MOBILE PENTIUM M	740 1.7GHz	750 1.8GHz	760 2.0GHz
RAM STD	512MB	512MB	512MB
HARD DRIVE	60GB*	80GB*	100GB*
SCREEN	15" XGA TFT	15" SXGA+ TFT	15" UXGA TFT
VIDEO RAM	64MB	128MB	128MB
OPTICAL DRIVE	DVD SuperMulti	DVD SuperMulti	DVD SuperMulti
WIRELESS LAN	WiFi a/b/g	WiFi a/b/g BT	WiFi a/b/g
WARRANTY	1 year	1 year	1 year
OP SYSTEM	XP Pro	XP Pro	XP Pro
RENT*	\$29.40/wk	\$36.96/wk	\$41.00/wk
PART NUMBER	R3726	R3727	R3728
PRICE	\$2,799	\$3,499	\$4,499

*Accessible capacity of hard drive may be less due to pre-installed software and recovery partition.

FOR BUSINESSES ON THE MOVE

THE HANDHELD THAT'S ALSO A DRIVE.

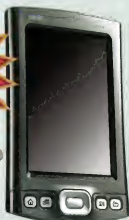
THE TUNGSTEN T5

Key facts:
 • 128MB¹ of storage
 • Transfer files and folders back and forth to your desktop
 • Works like a flash drive with another computer²
 • Running 320 x 480 display, landscape or portrait mode
 • Create and edit Word and Excel docs, view PowerPoint files
 • View photos, videos³ and play MP3s
 • Built-in Bluetooth wireless technology
 • Powerful Intel 416MHz XScale processor
 • Palm OS 5.4
 • 128MB actual storage capacity (160MB internal flash drive, 55MB program memory for applications & data)
 • Test computer must support standard USB removable drive
 • Some files may require conversion



**BONUS
BUNDLE*
CRADLE KIT
& LEATHER
CASE**

TUNGSTEN T5



Rent* \$6.49/wk

808 **\$529**

ORDABLE AND PACKED WITH PRODUCTIVITY
WHEREVER BUSINESS TAKES YOU

TUNGSTEN T2

...a brighter, richer colour screen, it brings your
 ...ndar, contacts, documents and presentations,
 ...os and videos to life. Plus, flash memory keeps
 ...mation safe if you don't have time to recharge.

...MB of flash storage
 ...play your data on a
 ...ghter 320 x 320 colour
 ...play
 ...reased battery life
 ...w photos, videos
 ...d play MP3s (requires
 ...ditional expansion card,
 ...ld separately)
 ...uilt in Bluetooth wireless
 ...chnology
 ...reate and edit Word
 ...d Excel docs, view
 ...werPoint files
 ...tel 200MHz XScale
 ...ocessor with Palm OS 5.4



9437 **\$399**

...ceive a bonus cradle kit & leather case bundle. Valid until 31/07/05 or while stocks last. Not available in
 ...junction with any other offer. *Cashback & bonus headset via palmOne redemption. See [www.palmone.com/
 products/promotions/treo650headset](http://www.palmone.com/products/promotions/treo650headset) for details.

GSM/GPRS QUAD-BAND SMARTPHONE

Treo 650

The Treo 650 smartphone simplifies your life by
 combining a compact mobile phone with email, an
 organiser, messaging and web access. Not to mention
 an MP3 player⁴, a digital camera that captures video
 and a vibrant colour screen that brings everything to
 life.

- Full featured mobile phone and Palm Powered organiser
- 22MB user accessible memory; SDIO/MMC
- Bright colour backlit 320 x 320 display
- Built in Bluetooth wireless technology
- Built in VGA camera
- Palm OS 5.4; weight 178g

⁴ Requires
 expansion card,
 sold separately.



**BONUS
BLUETOOTH
HEADSET***



Rent* \$11.19/wk

R3503 **\$999**

REVOLUTIONISE THE WAY
 YOU MANAGE YOUR LIFE WITH
 LIFE DRIVE

LifeDrive™



palmOne introduces the all new
 LifeDrive mobile manager. With
 3.8GB of storage and built in WiFi
 & Bluetooth support, you can
 easily carry files from your desktop
 computer; 300 songs, 2.5 hours of
 video, vacation photos, and more.
 Includes support for POP, IMAP
 and Exchange email accounts,
 plus onboard voice recorder, MP3
 player, and photo viewer.

- 4GB hard drive (3.85GB user accessible)
- LifeDrive smart file management
- WiFi (802.11b) and Bluetooth v1.1
- 320 x 480 hi-resolution, colour display
- Supports native Word, Excel, and PowerPoint files
- Supports secure wireless email access with attachments
- Built in Microsoft Exchange ActiveSync⁴
- Camera companion software
- MP3 player
- Intel 416MHz XScale processor

⁴Requires Microsoft Exchange
 Server 2003.

Rent* \$10.07/wk

S1814 **\$899**

*RENTSMART

The figures quoted are based on a per
 week basis over 3 years. Terms and
 conditions apply.

PLEASE NOTE:

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 conditions and returns policy.
 Delivery charges may apply.
 Not all items stocked in store but
 available for pick-up/delivery.



HP COMPAQ NOTEBOOKS & POCKET PCs

†Purchase any new HP notebook in July and get a HP PSC Officejet 2355 Colour Printer/Scanner/Copier for 50% off!

\$139!

Normally \$279



R4005

HP COMPAQ nx8220
NOTEBOOK PC

High-end performance in a thin and light widescreen design

PV202PA

- Intel Pentium M 740 1.7GHz
- 60GB* hard drive

\$26.65/wk

R9130

\$2,495

PV203PA

- Intel Pentium M 750 1.8GHz
- 80GB* hard drive

\$31.51/wk

R9131

\$2,995

EE117PA - POWER WORKHORSE!

- Intel Pentium M 770 2.1GHz
- 80GB* hard drive
- 1GB DDR RAM

\$40.78/wk

S2985

\$3,995

ALL nx8220 MODELS INCLUDE:

- 512MB DDR RAM (unless otherwise stated)
- 15.4" widescreen display
- DVD±RW optical drive
- 56k V.92 modem & Gbit LAN
- Wireless LAN 802.11a/b/g Wi-Fi
- Mobility Radeon X600 graphics
- **BONUS! MICROSOFT OFFICE BASIC**
- Microsoft XP Professional

† TERMS & CONDITIONS:

Offer available from 01/07/05 to 31/07/05. Not available in conjunction with any other offer.

*RENTSMART

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HP COMPAQ nx6120 NOTEBOOKS

Packed to perform, priced to please.

The HP Compaq nx6120 Business Notebook is packed with advanced technology features offering solid performance at a surprisingly affordable price. What's more, most models come with wireless connectivity so that you can get the job done effortlessly, wherever your work takes you.



BONUS
Microsoft
Office Basic
with selected
models†

MODEL	nx6120	nx6120	nx6120 †	nx6120 †	nx6120 †
PROCESSOR	C-M 360	C-M 360	P-M 730	P-M 730	P-M 730
CLOCK SPEED	1.4GHz	1.4GHz	1.6GHz	1.6GHz	1.7GHz
RAM	256MB	256MB	512MB	512MB	512MB
HARD DRIVE	40GB#	40GB#	40GB#	60GB#	80GB#
SCREEN	15" XGA	15" XGA	15" XGA	15" XGA	15" SXGA
OPTICAL DRIVE	Combo	DVD±RW	DVD±RW	DVD±RW	DVD±RW
WIRELESS LAN		802.11b/g	802.11b/g	802.11b/g + BT	802.11b/g + BT
WARRANTY	1 year	1 year	1 year	1 year	1 year
RENT*	\$15.63/wk	\$18.99/wk	\$22.36/wk	\$23.48/wk	\$25.58/wk
PART NUMBER	R7182	R7183	R7184	R7185	R7186
PRICE	\$1,395	\$1,695	\$1,995	\$2,095	\$2,395

HP POCKET PC's

The slim and sleek HP iPAQ series Pocket PC's make it easy to be productive at work, at home, or on the go.

Whether you are at the beach or just stepping out of the office, you can always enjoy total control without being tied down. With its broad range of features, popular applications, expansion capabilities and multimedia solutions, you can have all the essentials you need at the affordable value you want. All units run Microsoft Windows Mobile 2003 and come with 12 months manufacturer's warranty. Includes: AC Adaptor, USB Sync Cable, Stylus, Companion CD and Documentation Kit



Image for
illustration
purposes only



iPAQ	rz1710	hx2100	rx3417	rx3715	hx2750	hx4710
PROCESSOR	203MHz	312MHz	300MHz	300MHz	624MHz	624MHz
MAIN MEMORY	25MB RAM	64MB RAM	92MB RAM	152MB RAM	192MB RAM	144MB RAM
DISPLAY	3.5" TFT touch screen 240 x 320				4" 480x640	
WEIGHT	120g	164g	147g	158g	164g	180g
EXPANSION	SDIO	CF / SDIO	SDIO	SDIO	CF / SDIO	CF / SDIO
COMMUNICATIONS		BT	BT & Wi-Fi	BT & Wi-Fi	BT & Wi-Fi	BT & Wi-Fi
RENT*		\$6.71/wk	\$7.83/wk	\$9.85/wk	\$8.95/wk	\$9.85/wk
PART NUMBER	P5971	Q2079	P5974	P5973	Q2213	P5976
PRICE	\$399	\$499	\$599	\$699	\$879	\$799

*Accessible capacity of hard drive may be less due to pre-installed software and recovery partition.



invent

harristechnology



Desktop

DESKTOPS

dx5150 MT & SAMSUNG 710V BLACK 17" LCD MONITOR BUNDLE



- Pixel pitch: 0.264mm
- Contrast ratio: 500:1
- Viewing angle (H/V) 150° degrees / 120° degrees
- Response time: 25ms
- Analog interface
- 1280 x 1024 maximum resolution
- 3 year on site exchange and zero dead pixel policy*

Intel Core 2 Duo E6700 Processor
2GB RAM (2x256)
7200 rpm hard drive*
DVD±RW Drive
Keyboard and mouse
Windows XP Professional

DX5150 MICRO TOWER DESKTOP PC & SAMSUNG 710V 17" LCD MONITOR

S453 Rent* \$14.56/wk

\$1,299

6120 SLIM TOWER DESKTOPS

HP Compaq Business Desktop dx6100 series provides the proven technology along with the ultimate balance of price and performance to meet every business computing need.

Intel Pentium 4 Processor
Intel 915g chipset
3.0Mhz 1MB cache with Hyper Threading
2GB RAM
7200 (7200 rpm) hard drive*
Keyboard and mouse
USB 2.0 ports
Windows XP Professional
3 year warranty on parts

**BONUS
MICROSOFT
OFFICE BASIC**
(with purchase of
\$5447 or \$5448)



DX6120 ST P4 2.8GHZ HT WITH COMBO DRIVE

S447 Rent* \$13.43/wk

\$1,199

DX6120 ST P4 3.2GHZ HT WITH DVD+/-RW DRIVE

S448 Rent* \$15.68/wk

\$1,399

*Possible capacity of hard drive may be less due to pre-installed software and recovery partition.

Please contact Samsung Electronics Australia on 1300 362 603 or email: monitor.service@samsung.com
Full Terms & Conditions.

store.ht.com.au

DX2000 MT

**BONUS
MICROSOFT
OFFICE BASIC**
(with purchase of
\$5444 or \$5446)



Images for illustration purposes only.

PK862PA

- Celeron 330 2.66GHz
- 256MB RAM
- 40GB hard drive*
- CD-RW Drive
- Windows XP Professional

Rent* \$8.95/wk

S5444

\$799

PK010PA

- P4 3.0GHz Hyper Threading
- 256MB RAM
- 40GB hard drive*
- CD-RW Drive
- Windows XP Professional

Rent* \$11.19/wk

S5446

\$999

*RENTSMART

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PLEASE NOTE:

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Delivery charges may apply.
Not all items stocked in store but available for pick-up/delivery.

HP ML350 G3 SERVERS

HP PROLIANT G3 ADV ECC
PC2100 DDR SDRAM MODULEG3665 256MB **\$257**G3666 512MB **\$465**

Rent* \$9.63/wk

G3667 1GB **\$860**HP PROLIANT
HOT-PLUGGABLE ULTRA320
SCSI HARD DRIVESG9467 36GB 15k **\$489**

Rent* \$7.61/wk

G9468 72GB 15k **\$679**

Rent* \$7.05/wk

G9464 72GB 10k **\$629**

Rent* \$10.98/wk

G9465 146GB 10k **\$980**HP 3 YEARS 4HR 9X5 ONSITE
WARRANTY FOR ML350
SERVERM7176 **\$869**

*RENTSMART

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HP PROLIANT ML350 G3
Xeon 3.06GHz, 512MB, SCSI, GBIT SERVERS

HP ProLiant servers deliver intelligent innovation, proven performance, and demonstrated value that you can bet your business on. With the right solution for your environment, HP helps you manage costs, increase quality, mitigate risk, and improve agility. More businesses trust HP ProLiant systems than any other server technology. Because enterprise demands more—more accountability, more agility, and a better return on IT.

PRODUCT FEATURES:

- Intel® Xeon™ 3.06GHz processor with 533MHz FSB
- Dual processor capability
- Cache 512-KB integrated, full-speed level 2 cache per processor
- 512MB RAM (of 2-way interleaving capable PC2100 DDR SDRAM running at 266MHz, with Advanced ECC capabilities), expandable to 8GB
- No HDD ship standard
- Max Internal Storage 1.174 TB GB (6 x 146.8 GB 1" with standard internal hot plug drive cage + (2 x 146.8 GB with optional ML3xx Two Bay Hot Plug SCSI Drive Cage)
- Graphics Integrated ATI RAGE XL Video Controller with 8-MB SDRAM Video Memory • 48x IDE (ATAPI) CD-ROM drive
- Integrated Dual Channel Wide Ultra3 SCSI Adapter
- 5 total accessory slots available: four 64-bit/100MHz PCI & one 32-bit/33MHz PCI
- Integrated LAN NC7760 PCI Gigabit Server Adapter (embedded)
- 6 x 1" Wide Ultra3 Ultra320 ready Hot Plug Drive Cage
- I/O Ports One parallel, 1 serial, one RJ-45 Ethernet, keyboard and mouse, 2 USB, 1 graphics port & 2 external SCSI knockouts
- NOS Support Microsoft Windows Server 2003, Microsoft Small Business Servers 2003 and 2000, Microsoft Windows 2000 Server and Advanced Server, Microsoft Windows NT® Server 4.0 and Terminal Server 4.0, NetWare, Novell NetWare Small Business Suite, SCO® OpenServer, SCO OpenUnix® 8, SCO UnixWare®, IRIX® 6.5, OS/2 Warp Server for e-business & LINUX® (Red Hat®, 2.1 Advanced Server, SuSE®, SLES7, UnitedLinux®)
- Bundled Software Insight Manager 7, HP Systems Insight Manager & SmartStart
- System Dimensions 19in(W) x 24in(D) x 8.61in(H)
- 5U Form Factor

TOWER MODEL
HP PROLIANT ML350 G3RACK MODEL
HP PROLIANT ML350 G3R

Rent* \$22.40/wk

L4237

LIMITED STOCK **\$1,999**

Rent* \$23.52/wk

L5130

LIMITED STOCK **\$2,099**

Images for illustration purposes only

ACER NOTEBOOKS

TRAVELMATE 2355LCi

TravelMate 2355 is the perfect partner for enhancing efficiency and success with its combination of robust processing power, graphics capabilities, communications and dependable design.

Intel Celeron M 360 1.4GHz
1GB RAM
15" XGA Screen
80GB Hard Disk*
DVD/CD-RW Combo Drive
USB 2.0 Ports
Wireless LAN
Wi-Fi 802.11g with SignalUp Technology
Windows XP Professional



Rent* \$13.43/wk

435

\$1,199

TRAVELMATE 4152LMI

Professionally balanced TravelMate 4152 is well designed to optimise your productivity and amplify success, combining solid processing and graphics capabilities, with wide ranging functionality.

Intel Pentium M 740 1.7GHz
2GB DDR2 RAM
15" XGA Screen
80GB Hard Disk*
DVD±RW Dual Layer Drive
USB 2.0, Firewire, S-Video Out
Wireless LAN
Wi-Fi 802.11g with SignalUp Technology
Up to 5.5 hours of battery life
Windows XP Professional



Rent* \$22.40/wk

189

\$1,999



BOOST YOUR WIRELESS CONNECTION WITH ACER SIGNALUP

A breakthrough that boosts wireless performance by a minimum of 25%. Acer technology provides a more stable signal with higher quality wireless both outdoors and in difficult indoor environments.

*Available capacity of hard drive may be less due to pre-installed software and recovery partition.

ACCESSORIES

TRAVELSURE CARRY CASE

M0838

\$49

EXTERNAL USB 1.44MB FLOPPY DISK DRIVE

L1793

\$79

ADDITIONAL BATTERY for TravelMate 2350 / 4150

R9626

\$240

AC AUTO/AIR TRAVELDAPTOR

R9566

\$179

AC ADAPTOR + POWER CORD for 4150 Series

L1702

\$137

TARGUS USB 2.0 MOBILE PORT STATION

N0426

\$209

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

VAIO NOTEBOOKS

THE ULTIMATE
MULTIMEDIA POWER
PACKAGE

The power of a desktop,
the portability of a notebook,
the style of Sony.

Introducing the full featured
notebook with Centrino mobility
and large 17" display, designed to
out perform in the office and to
entertain at home.

VGN49GP

- Pentium M 770 2.1GHz
 - 17" WUXGA with clear bright dual lamps LCD
 - HD audio
 - HD video ready
 - 1GB RAM
 - 100GB HDD (5400RPM)*
 - 128MB video RAM
 - DVD±RW dual layer drive
 - Wireless LAN 802.11b/g
 - Windows XP Professional
- Supplied Accessories include:**
- Port Replicator
 - Stereo Speakers
 - Remote Control

Rent* \$46.13/wk

\$4,999

R9249

*RENTSMART

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week basis over 3 years. Terms and
conditions apply.

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available for pick-up/delivery.

STUDY & BUSINESS

VGNB77GP

- Pentium M 735
- 1.7GHz
- 512MB RAM
- 40GB HDD*
- DVD/CD-RW Combo Drive
- Wireless LAN 802.11b/g
- 14.1" XGA Display
- Weighs only 2.3kg
- Windows XP Professional



Rent* \$22.40/wk

S1263

\$1,999

VGNB99GP

- Pentium M 725 1.6GHz
- 512MB RAM
- 40GB HDD*
- DVD±RW dual layer drive
- Wireless LAN 802.11b/g
- 14.1" SXGA+ display
- Weighs 2.3kg
- Windows XP Professional

Dual
Layer Drive
Weighs 2.3kg

Rent* \$24.56

R0602

\$2,299

ULTRA PORTABLE

VGN548GPB

- Pentium M 760
- 2GHz
- 512MB RAM
- 60GB HDD*
- DVD±RW Dual-Layer Drive
- 13.3" WXGA Clear Bright LCD
- Wireless LAN 802.11b/g
- Integrated bluetooth
- Windows XP Professional

NEW!
Hot Price

Rent* \$36.45/wk

34275

\$3,499

VGN37GPGS

- Pentium M 753 1.2GHz
- 1GB RAM
- 60GB HDD*
- DVD±RW dual layer drive
- Wireless LAN 802.11b/g
- 10.6" WXGA with Clear Bright
- Integrated bluetooth
- Weighs only 1.38kg
- Windows XP Professional

Up to
8.5 hrs
Battery
Life

Rent* \$38.53

S1262

\$3,699

WIDE SCREEN, FAST & SLIM

VGNFS15GP

- Pentium M 730
- 1.6GHz
- 512MB RAM
- 40GB HDD*
- DVD/CD-RW Combo Drive
- Wireless LAN 802.11b/g
- 15.4" WXGA Clear Bright LCD
- Windows XP Professional

BONUS
BUNDLED
BAG

Rent* \$24.64/wk

Q9516

\$2,199

VGNFS18GP

- Pentium M 740
- 1.7GHz
- 512MB RAM
- 80GB HDD*
- DVD±RW dual layer drive
- Wireless LAN 802.11b/g
- 15.4" WXGA Clear Bright LCD
- Windows XP Professional



Rent* \$31.55/wk

Q9515

\$2,999

*Accessible capacity of hard drive may be less due to pre-installed software and recovery partition.

ET MOBILE...GET TARGUS

BUSINESS CASES

OTHER NOTEBOOK CASE



UNDER \$100

UP TO 15.4" SCREENS

affordable leather case with scratch lining, comes with a zip down front and a removable mesh accessory pouch for added storage.

598 **\$95**

ALUMINIUM ATTACHÉ



UP TO 17" SCREENS

With self locking closure and scratch resistant panels, this sleek case is constructed of aluminium, offering a classic look with a futuristic update.

Q9517 **\$129**

LEATHER ATTACHÉ CASE



UP TO 15.4" SCREENS

Hand crafted from luxurious leather, this stylish case is designed for organisational efficiency, with compartments for a notebook computer, files and additional hardware. Includes lock & key for asset security.

P6998 **\$139**

ICE

RA MINI 5 BUTTON OPTICAL MOUSE



WORLD'S SMALLEST 5 BUTTON OPTICAL MOUSE

For travel, this compact optical mouse with USB retractable cable is the world's smallest 5 button mouse!

0655 **\$35**

KALEIDOSCOPE MOUSE



Decorate your desktop with this full size optical mouse with 7 rainbow colours rotating around the mouse's top cover.

E4962 **\$35**

BLUETOOTH MINI MOUSE WITH ADAPTOR



Bundled with a Bluetooth adaptor this mouse features a unique auto pair-up button that provides one touch quick, easy and accurate connecting of Bluetooth devices to the PC.

Q3054 **\$159**

STORAGE DRIVES

2.0 SLIM EXTERNAL HARD DRIVE



SIZE OF A POST-IT NOTE

40GB external USB hard drive, lightweight and slim 4.5cm form factor. Includes the award winning Retrospect 6.5 software for convenient one touch backups.

5784 **\$485**

USB 2.0 DVD/CD-RW SLIMLINE COMBO DRIVE



The ultimate 24x portable DVD/CD-RW available. Allowing true mobility, it does not require an AC adaptor, making it a perfect solution for the mobile user.

M2732 **\$449**

USB 2.0 DVD±RW SLIM EXTERNAL DRIVE



The ultimate 24x portable DVD±RW available. Allowing for true mobility, it does not require an AC adaptor, making it a perfect solution for the mobile user.

R3884 **\$549**

VALUE BUNDLE



S5218 **\$165**

MOBILE OFFICE BUNDLE



S2607 **\$189**

CORPORATE BUNDLE



A5089 **\$199**

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BELKIN ACCESSORIES

SOHO SERIES UPS SERIAL & USB 650VA - \$100,000 WARRANTY



F6H650AUUNV

In a power outage or brownout, the SOHO Battery Backup automatically switches your computer to battery backup power and gives you the time to save open files and safely power off. As the leading developer of power protection solutions, Belkin engineers and rigorously tests all its products to ensure your equipment will be safe from harmful electrical disturbances.

BENEFITS

- Provides up to 30 minutes of backup time
- Battery capacity load: 650VA (390W)
- 3 battery backup sockets, 3 surge-protected-only sockets
- USB and Serial communication ports
- Shuts down your system and documents safely with included Belkin Power Management Software
- Provides DSL/broadband protection (RJ11 ports 1-in, 1-out)
- Filters electromagnetic/radio frequency interference (EMI/RFI)
- Provides quality surge protection with 1620J
- Comes with a Belkin 3-year product warranty and \$100,000 connected equipment warranties

M0848

\$299

PLEASE NOTE:

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ECONOMY 2-PORT KVM WITH CABLES ATTACHED, 2M, USB & AUDIO SUPPORT



F1DL102U

- Offers a complete compact solution with audio support and built-in cables
- Features a manual port selector and LED indicators
- Video resolutions up to 2048x1536
- Supports multiple operating systems
- Requires no power supply

N8931

\$85

F1DH102UUA



F1DH102UUA

- Supports Dual-Head VGA computers
- Switches through USB hot keys and direct-access port selectors
- Offers speaker and microphone support
- Flash-upgrades firmware easily
- 10-second auto-scan mode

S3954

\$275

HOME SERIES SURGE CUBE + \$40,000 WARRANTY



F9H100VAUCW

Single outlet Surge cube for total protection of one unit

- Comes with \$40,000 connected equipment warranty for total protection of your valuables
- Provides greater spike and lightning absorption with 25000Amps maximum spike current rating

N3355

\$25

ECONOMY 4 PORT SWITCH - PS/2 ONLY, ALL CABLES INCLUDED, 1.8M



F1DB104P

- Supports video resolutions up to 2048x1536@65Hz through a 400MHz bandwidth
- Features hot key switching and manual push-button port selection
- 10 second auto-scan function
- 2-year warranty and technical support

D3159

\$149

OMNIVIEW USB SOHO SERIES CABLE KIT WITH AUDIO, 1.8M



F1D9101-06

- Package includes one USB cable, one HDB15 VGA cable, and one all-in-one audio microphone cable
- Industry standard 14-pin coaxial VGA cabling to support high resolution applications
- Belkin Lifetime Warranty
- Also available in PS/2-style

F8588

\$35

HOME SERIES 4-WAY (2M CORD) + \$40,000 WARRANTY



F9H400AU2M

- 4-outlet surge board for total protection of 4 items plus phone line
- Comes with Belkin's Lifetime Warranty - only buy it once!
- Comes with \$40,000 connected equipment warranty for total protection of your valuables

N3358

\$45

SOHO 4-PORT USB KVM SWITCH WITH 2 ADDITIONAL SWITCHING USB PORTS



F1DS104UUA

- Control up to four computers through USB hot key switching and direct access port selectors
- Audio and microphone switching support
- Supports USB console and computers, video resolutions up to 2048x1536@65Hz

F1148

\$22

OMNIVIEW DUAL-HEAD (VGA) SOHO SERIES CABLE KIT WITH AUDIO, 3M



F1D9101-10

- Package includes one USB cable, four HDB15 VGA cables, and one all-in-one audio microphone cable
- Industry standard 14-pin coaxial VGA cabling to support high resolution applications
- Belkin Lifetime Warranty

F8589

\$3

SUPERIOR SERIES 6-WAY (2M CORD) + TEL + \$150,000 WARRANTY



F9S623AU2M

- 6-outlet surge board for total protection of 6 items plus phone line
- Comes with Belkin's Lifetime Warranty - only buy it once!
- Comes with \$150,000 connected equipment warranty for total protection of your valuables

N3367

\$9



harristechnology



Accessories

CORDLESS AND OPTICAL COMBINATIONS

QUICKCAM EXPRESS



QuickCam® Express - the simple way to get closer, face-to-face online by making live video calls. Send and send photos as easily as you send text. You can even shoot and send video e-mail. No camera is necessary at the other end

301

\$65

QUICKCAM IM



Logitech® QuickCam® IM lets you get closer instantly with live video and audio. Make your instant messages come alive. Add live video to your favorite IM. Works with MSN® Messenger, Yahoo!® Messenger & Windows® Messenger. QuickCam IM includes a bonus headset for private conversations and a bonus clip for notebooks & flat panel monitors. Capture videos and photos and e-mail them in one simple click.

N9485

\$79

TECH CORDLESS DESKTOP LX 300



Logitech® Cordless Desktop® LX 300 cleans up your work space, and empowers your style. Control music and video playback, open e-mail or Instant Messenger, or navigate the Web directly from the keyboard. Distinctive F-keys are programmable. Premium cordless optical mouse tracks precisely, while ultra-flat keyboard delivers leading-edge comfort.

185

\$79

CORDLESS DESKTOP LX 700



The Logitech® Cordless Desktop® LX 700 is a premium blend of form and function, with rechargeable cordless optical mouse. MediaLife® software presents your media library in a single easily navigated interface. Includes sleek one-touch controls for media, communication, and frequent applications. Plus keyboard-based navigation controls that complement the rechargeable mouse.

P3354

\$149

TECH X-230 2.1 SPEAKERS



Link up the PC audio with Logitech's X-230 speaker system. Its dual driver satellites eliminate uneven response created by conventional dual driver designs using FDD2™ technology. The ported subwoofer features a real-time equalizer that maximises punch while minimising distortion. The X-230 speaker system has convenient volume and subwoofer level controls.

3348

\$75

LOGITECH X-530 5.1 SPEAKERS



Pump up your PC surround sound with Logitech's X-530 speaker system. Dual driver satellites use FDD2™ technology to eliminate uneven response created by conventional dual driver designs. The ported subwoofer features a real-time equalizer that maximises punch while minimising distortion. Matching front and rear satellites deliver balanced surround sound.

P3349

\$123

MOBILE FREEDOM HEADSET



Logitech Mobile Freedom Headset features eight hours of talk time and the WindStop microphone. This Bluetooth headset has the performance you need to stay in touch anywhere you go.

Q5788

\$65

PORTABLE SPEAKERS MM22



NB: iPod not included

Logitech's MM22 Portable Speakers are the perfect travel companion for your iPod. A deluxe, hard-shell traveling case holds your cables, AC adapter, and speakers neatly.

R8876

\$89

PREMIUM STEREO HEADSET



Use the convenient and comfortable Logitech Premium Stereo Headset for gaming, voice chat, online conference, voice command, or just listening to music.

R7533

\$35

OPTICAL MOUSE



Features the world's best-selling optical technology for incredibly smooth tracking and high-quality scroll wheel. USB and PS/2. 3 year warranty. Also available in white.

N6101 WHITE

\$23

N9100 BLACK

\$23

PLEASE NOTE:

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WIRELESS / BROADBAND SOLUTIONS

BASE HOME NETWORK INSTALLATION PACKAGE

Initial Installation of Network



- Base home network installation package for initial installation of network
- Connect up to 2 PCs (desktop and/or laptop)
- Connect 1 D-Link router
- Install 2 D-Link network adapters
- Connect D-Link router to existing broadband connection
- Share internet connection between 2 computers
- Perform standard testing
- Coverage within 80kms of metro areas

DIS-101
R1400

\$145

802.11G WLAN INTERNET/SECURITY CAMERA



The DCS-5300G is a fully-featured surveillance system that connects to an ethernet or wireless broadband network to provide remote high-quality video and audio.

- 802.11g wireless internet camera
- Built-in microphone for audio monitoring and recording
- Built-in motion detection with e-mail notification
- Connection to TV or VCR for recording

DCS-5300G Rent* \$12.65/wk
R9200 **\$899**

*RENTSMART

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54Mbps DESKTOP BUNDLE

AirPlus G 54Mbps BUNDLE



DI-524 + DWL-G510

D-Link DI-524 2.4GHz 802.11g Wireless Router 54Mbps high-speed wireless broadband Internet access 802.11g Standard, 802.11b Compatible Built-in 4-port Fast Ethernet switch for ready server connection.

D-Link AirPlusG Enhanced 2.4GHz (802.11g) Wireless PCI Adapter Increased Security with 802.1x and WPA. Great for Video Streaming. User-friendly configuration and diagnostic utility.

\$1177

\$149

54Mbps NOTEBOOK BUNDLE

AirPlus G 54Mbps BUNDLE



DI-524 + DWL-G630

D-Link DI-524 2.4GHz 802.11g Wireless Router 54Mbps high-speed wireless broadband Internet access 802.11g Standard, 802.11b Compatible Built-in 4-port Fast Ethernet switch for ready server connection.

D-Link DWL-G630 11/54Mbps Wireless LAN PCMCIA card Increased Security with 802.1x and WPA. Great for Video Streaming. User-friendly configuration and diagnostic utility.

\$1156

\$149

108Mbps DESKTOP BUNDLE

AirPlus Xtreme G 108Mbps BUNDLE



DI-624 + DWL-G520

D-Link DI-624 Wireless G Router Up to 108Mbps, advanced firewall & parental control. 802.11g, 802.11b compatible, increased security with 802.1X and WPA.

D-Link DWL-G520 Wireless PCI Adapter 802.11g 108Mbps Wireless PCI Adapter

\$1284

\$179

108Mbps NOTEBOOK BUNDLE

AirPlus Xtreme G 108Mbps BUNDLE



DI-624 + DWL-G650

D-Link DI-624 Wireless G Router Up to 108Mbps, advanced firewall & parental control. 802.11g, 802.11b compatible, increased security with 802.1X and WPA.

D-Link DWL-G650 Wireless 2.4Ghz CardBus Adapter Upto 108Mbps and fully compatible with 802.11b

\$1285

\$179

SECURITY SOLUTIONS

WIRELESS VPN ROUTER FOR DSL/CABLE

DI-824VUP+

- 10/100BASE-TX port for DSL cable modem connection
- 4 built-in 10/100BASE-TX switch ports with auto MDI/MDIX support
- Built-in 802.11g WLAN with up to 54Mbps wireless speed



ADSL 2/2 + MODEM/ROUTER WITH USB/ETHERNET PORT

DSL-502T

The DSL-502T is an ADSL Internet Gateway Router designed for the small office and home. This router lets you quickly and easily connect to high-speed broadband Internet and share your ADSL line. With a built-in ADSL interface, USB/Fast Ethernet port and advanced functions, this router gives your business and home a convenient and cost-effective way to install a secure, fast network link to the outside world.



N0963

\$299

R6714

\$119

ADSL MODEM/ROUTER WITH 54Mbps WIRELESS

DSL-G604T

- The DSL-G604T is an ADSL router designed for home or office use. It lets you quickly and easily connect to high speed broadband Internet and share your ADSL line.
- ADSL2, ADSL2+ Upgradeable
- 4 port fast ethernet & 802.11g wireless connectivity
- Supports WPA security
- Secure NAT/DHCP functions
- Telstra approved
- Supports all major ISP'S
- 3 years warranty

P3062

\$199

SWITCHING SOLUTIONS

UNMANAGED SWITCHES

5 PORT 10/100/1000 UNMANAGED SWITCH

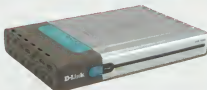


DES-1005D

The D-Link DGS-1005D is a 5 port 10/100/1000Mbps unmanaged switch that delivers power, performance, and reliability in one cost-effective, space-saving design. Increase the speed of your network server and backbone connections, or make gigabit to the desktop a reality.

\$155

8 PORT 10/100/1000 UNMANAGED SWITCH



DGS-1008D

The D-Link DGS-1008D is a 8 port 10/100/1000Mbps unmanaged switch that delivers power, performance, and reliability in one cost-effective, space-saving design. Increase the speed of your network server and backbone connections, or make gigabit to the desktop a reality.

\$229

ETHERNET SWITCHES

24 PORT 10/100 STACKABLE SWITCH



DES-3550

The D-Link DES-3500 series of 10/100Mbps Stackable Switches are mutually stackable switches that feature D-Link's state-of-the-art Single IP Management technology. Equipped with 48 10/100BASE-TX ports and 2 combo 1000BASE-T/SFP Gigabit in a low-profile rackmount box, these switches are designed for secure and flexible connection.

Rent* \$17.09/wk

\$1,525

24 PORT 10/100 STACKABLE SWITCH



DES-3526

Features a non-blocking switching architecture The D-Link DES-3500 series of 10/100Mbps stackable switches are mutually stackable switches that feature D-Link's state-of-the-art single IP management technology. Equipped with 24 10/100BASE-TX ports and 2 combo 1000BASE-T/SFP gigabit in a low-profile rackmount box, these switches are designed for secure and flexible connection.

Rent* \$10.92/wk

\$975

LAYER 2 MANAGED SWITCH

24 PORT 10/100Mbps SWITCH + 2 MINI GBIC SLOTS

DES-3250TG

High Density, Low Profile Solution
Standards-Based Network Management
Investment Protection

The D-Link DES-3250TG is a high performance managed Layer 2 auto-sensing 10/100Mbps switch that provides an ideal solution for high density enterprise applications. With 48 x 10/100Mbps ethernet ports and 2 x combo 10/100/1000Mbps/SFPs (mini-GBIC) slots, the DES-3250TG is designed to meet the needs of the most demanding departmental and enterprise connectivity applications requiring a high density, low profile solution.



Rent* \$6.71/wk

\$599

24 PORT 10/100 Mbps MANAGED SWITCH



D-Link DES-3226S is a 24 Port 10/100 Mbps stackable managed switch.

Optional Gigabit or fibre module also available.

• 5 year warranty, advanced replacement next day warranty

DES-3226S Rent* \$10.07/wk

F9634

\$899

UTP UNMANAGED 10/100 SWITCHES

DES-1005D DESKTOP 5 PORT



Dual Speed 10/100Mb Ethernet/Fast Ethernet NWay auto-negotiating Switch.
85101

\$55

DES-1008D DESKTOP 8 PORT



Provides SOHO users W/ MB access for video, high speed data and internet.
98254

\$85

DES-1016D 16 PORTS 10/100MBPS UNMANAGED



Fast Ethernet Unmanaged Switch. Includes Rackmount kit.
F0915

\$149

DES-1024D 24 PORT 10/100MBPS FAST ETHERNET



Unmanaged Switch Includes Rackmount kit.
G1783

\$239

*RENTSMART

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NETGEAR RANGEMAX™ - WIRELESS TO THE MAX

TAX TIME
BONUS

**HOT
BUNDLE**
WGT624 &
WG511T

108Mbps CABLE/DSL
WIRELESS ROUTER & PC CARD

WGT624

- 108Mbps wireless speed (when used with Netgear 108Mbps Adapters)

WG511T

- 108 Mbps Wireless PC Card

**HOT
PRICE**

S0555

\$179108Mbps SUPER WIRELESS
ADSL ROUTER

DG834GT

- All in One Gateway combines ADSL2+ modem, router, firewall, Super G access point and 4 port switch
- 108Mbps Wireless Speed with Super G Technology (when used with Netgear 108Mbps adapters)
- Easy to set-up, Smart Wizard gets you up and running in less than 5 clicks
- Over 10 security & privacy features including a double firewall (NAT + SPI)

Q5517

\$239

Check out www.netgear.com.au/warranty for full warranty options

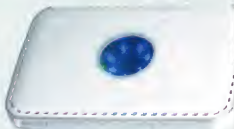
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RANGEMAX™ WIRELESS ROUTER

- WPN824

- Up to 1000% more wireless coverage and speed than 802.11g routers
- RangeMax™ Smart MIMO (Multi-In, Multi Out) Technology
- 7 Internal Smart Antennas adapt on the fly to interference
- SmartWizard™ Installation Assistant 100% compatible with 802.11b, 802.11g, and SuperG® devices
- Ultra-Secure (double firewall, WEP, WPA-PSK) protect against unauthorised usage



Please go to www.netgear.com.au/rangemax for more information

R5401

\$205

RANGEMAX™ ADAPTERS

Netgear's RangeMax Adapters, when used with the WPN824 Wireless Router, delivers up to 1000% the coverage and speed of 802.11g. New antenna technology has increased range beyond what was ever possible with previous generation Wi-Fi adapters. Keep your network private with WPA (Wi-Fi Protected Access). Setup is quick and easy with the Smart Wizard install assistant.

RANGEMAX™ WIRELESS PC
CARD - WPN511

R4068

\$109RANGEMAX™ WIRELESS USB 2.0
ADAPTER - WPN111

Q3512

\$145RANGEMAX™ WIRELESS PCI
ADAPTER - WPN311

R4066

\$10954Mbps WIRELESS PRINT
SERVER WITH 4 PORT SWITCH

WG606

- Two USB ports which allows up to two USB printers to be connected
- Wireless Ethernet Bridge mode which allows you to link up to 4 PCs to your wireless network and a 4 port 10/100 switch

R3980

\$175CABLE/DSL PROSAFE
WIRELESS ROUTER

FWG114P

- Integrated 54Mbps 802.11g wireless access point
- Advanced security with Stateful Packet Inspection (SPI) firewall, IPSec, PPTP, L2TP VPN pass-through support, WPA and WEP security for wireless

L2431

\$249PROSAFE VPN FIREWALL 50
ROUTER

FVS338

- Initiates up to 50 Hardware-Based VPN tunnels
- Advanced security using Stateful Packet Inspection (SPI) firewall Denial of Service (DoS) Protection and Intrusion Detection

R0166

\$355



NETGEAR™

harris technology



Networking

10 GIGABIT!

PROSAFE VPN FIREWALL 200



FSM7328S

Safe™ VPN Firewall 200 offers a complete security solution for small and medium sized companies. This rack-mountable, Stateful Packet Inspection (SPI) firewall is equipped with support for up to 200 security associations and VPN tunnels.

Eight auto-sensing 10/100Mbps LAN ports, one Gigabit LAN port and two 10/100 WAN ports allows multiple computers in your office to share two Internet connections. The dual WAN ports let you connect a second Internet line as a backup to insure that you're never disconnected. Ideal headquarter security solution for companies that need rock solid network protection and fast, secure VPN access for remote employees and branch offices at a cost-effective price point. Netgear's timesaving VPN Wizard and SmartWizard™ simplify setup and VPN administration. Includes, at no extra cost, the ProSafe VPN Client software 5-user license. Virtual Private Network Consortium (VPNC) tested* and certified VPN.

Rent* \$7.83/wk

FSM7328S

\$699

24 PORT LAYER 2 MANAGED SWITCH



FSM7328S

ProSafe Gigabit Ethernet connectivity for flexible deployment. Delivers wirespeed Gigabit performance and a full set of Layer 2 management features with unsurpassed affordability.

Rent* \$11.30/wk

\$1,009

FSM7328S

24 PORT 10/100 MBPS MANAGED STACKABLE SWITCH WITH GIGABIT PORTS STACKABLE LAYER 2 MANAGEMENT WITH BUILT-IN GIGABIT RED



FSM7328S

High Port Density with Layer 2 Management Flexibility. 24 10/100 ports, 2 Gigabit Ethernet ports. Stacks up to six units, and comes with the stacking cable.

Rent* \$9.96/wk

\$889

FSM7328S

PROSAFE 24 PORT 10/100 L3 MANAGED STACKABLE SWITCH WITH 4 GIGABIT PORTS



FSM7328S

Flexible, Stackable, Fast Ethernet Switching!

- 24 port switch with auto-sensing 10/100 ports and 4 10/100/1000 ports.
- Small Form-factor Pluggable (SFP) gigabit interfaces

Rent* \$8.95/wk

\$799

FSM7328S

24 PORT GIGABIT SMART SWITCH



GS524T

10/100/1000 Mbps Gigabit Switch gives your office network a megabooost of speed and capacity. 24 ports can blast 2000Mbps per port of data throughput in full-duplex mode. Robust and reliable network backbone for your 50 to 250 employee company.

Rent* \$10.41/wk

\$929

GS524T

TAX TIME BONUS

HOT BUNDLE
FSM7326P & WG102

PROSAFE™ 24 PORT 10/100 L3 MANAGED SWITCH WITH 2 GIGABIT PORTS AND POE & PROSAFE 802.11G WIRELESS ACCESS POINT



FSM7326P

- 24 port Layer 3 Managed 10/100 Switch
- 24 10/100 ports + 2 gigabit ports with fiber options Power over Ethernet (802.3af PoE), with redundant power supply port

WG102

ProSafe™ 108Mbps Wireless Access Point 802.11g with Management & PoE

HOT PRICE
Rent* \$24.08/wk
\$2,149

S1288

PROSAFE 802.11G WIRELESS ACCESS POINT



WG302

- High-speed networking with IEEE 802.11g, up to 108Mbps in turbo mode
- Powerful RF management and control with AutoCell technology
- Wi-Fi Protected Access (WPA), 802.11i-ready security
- 2 detachable 5 dBi antennas

L8310

\$399

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

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LINKSYS®

A Division of Cisco Systems, Inc.

A LEADER IN WIRELESS NETWORKING

SRX ROUTER

WIRELESS-G BROADBAND
ROUTER WITH SRX - WRT54GX

- Internet-sharing Router, 4 port Switch, with a built in speed and range enhanced Wireless-G (802.11g) Access Point
- Shares a single Internet connection and other resources with Ethernet wired, Wireless-G, -B, and other SRX devices
- New SRX technology: the farther away, the more advantage up to 8 times faster than standard Wireless-G (802.11g)
- SRX also increases wireless range by up to 3 times and reduces dead spots in coverage area

R8671

\$299

SRX CARD

WIRELESS-G NOTEBOOK
ADAPTOR WITH SRX -
WPC54GX

- High-speed Wireless-G networking for your notebook computer, now with SRX performance enhancement
- New SRX technology: the further away, the more advantage up to 8 times faster than standard Wireless-G (802.11g)
- SRX also increases wireless range by up to 3 times and reduces dead spots in coverage area
- Interoperates with standard Wireless-G and Wireless-B networks

R7227

\$175

PLEASE NOTE:

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ADSL2 USB, ETHERNET MODEM
- ADSL2MUE

- Harness the full potential of the Internet with the Linksys ADSL2 Modem.
- High-speed ADSL modem + 4 port switch gives you a fast, "always on" connection to the Internet
- Up to 12Mbps download speeds, 200 times faster than dial-up analog modems
- Shares your existing telephone lines to connect to the Internet, without tying up the phone
- Connects to your PC over 10/100 Ethernet or USB

R9752

\$95

4 PORT ADSL2 GATEWAY
SWITCH - AG241

- High speed ADSL Modem
- Built-in Router and 4 port Switch
- Jump start your Ethernet network and share the Internet throughout your household
- Advanced firewall and security features protect your PCs, your data, and your family
- Compatible with both ADSL1 or ADSL2 standards

R8961

\$155

WIRELESS G ADSL
GATEWAY - WAG54G

- ADSL modem with 4 x 10/100 switch ports
- Wireless 802.11G 54MB access point, supports both 11MB & 54MB clients
- Wireless security includes WEP, WPA & 802.1x
- Powerful stateful packet firewall with denial of service attack prevention
- VPN server, 5 VPN tunnels - also supports VPN pass-through
- 3 year manufacturer exchange warranty

M5307

\$199

WIRELESS-G BROADBAND
ROUTER - WRT54G

- All-in-one wireless internet Router, allows you to share your broadband connection wirelessly, 802.11G wireless, 4 port 10/100 ethernet switch
- Wireless data rates up to 54Mbps
- Shares a single internet connection and other resources with Ethernet wired and Wireless-G clients
- Advanced wireless security with 128 bit WEP encryption, MAC or IP address filtering
- 3 year manufacturer limited warranty

H9739

\$129

STORAGE LINK + MAXTOR 80GB
HARD DRIVE BUNDLE

- Connects USB 1.1 or 2.0 disk drives and flash disks directly to your network
- Share music, video, or data files with managed access by user name or group
- Integrated file server - access your files from the Internet
- Built-in disk utilities - format, backup, and scandisk

S3233

\$299

WIRELESS-G RANGE
EXTENDER - WRE54G

- The easiest way to expand your wireless network's coverage
- Save on wiring costs - no wired connection to your network necessary
- Extend your wireless signal into hard-to-reach areas
- Compatible with both Wireless-G and Wireless-B networking clients

P9344

\$129

LINKSYS®

A Division of Cisco Systems, Inc.

harristechnology



Networking

LEADER IN WIRELESS NETWORKING

WIRELESS-G BROADBAND ROUTER WITH SPEEDBOOSTER T54GS



Complies with 802.11g and 802.11b 54GHz Standards
SpeedBooster technology increases wireless performance by up to 35%
Enhanced Internet Security Management Functions including Internet Access Policies with Time Schedules
LAN Ports Support Auto-Crossover (MDI/MDI-X) - No Need for Crossover Cables

WIRELESS-G USB ADAPTOR WITH SPEEDBOOSTER WVS54GS



- Compatible with 802.11g and 802.11b (2.4GHz) Standards
- SpeedBooster technology increases wireless performance by up to 35%
- Supports USB 2.0 with up to 54Mbps, High-Speed Data Transfer Rate with Automatic Fallback
- Plug-and-Play Operation Provides Easy Setup
- Supports up to 128-bit WEP Encryption Security

WIRELESS-G ACCESS POINT WAP54G



- Set up a high-speed Wireless-G (802.11g) network in your home or office
- Data rates up to 54Mbps -- 5 times as fast as Wireless-B (802.11b) Also interoperates with Wireless-B networks (at 11Mbps)
- Advanced wireless security with WPA, 128-bit WEP encryption, and MAC filtering

24 PORT 10/100 + 2 PORT GIGABIT SWITCH WITH WEBVIEW SRW224



- 24 autosensing 10/100 full duplex, auto MDI/MDI-X ports
- Two Gigabit (10/100/1000BaseTX) MDI/MDI-X ports, and a mini GBIC expansion port
- WebView remote monitoring and configuration via web browser
- 64 VLANs, 7 port trunking groups, console port, 802.1p QoS support

R1140

\$449

H988

\$155

R9625

\$135

H9736

\$125

WIRELESS-G INTERNET VIDEO CAMERA IC54G



Provides a high-quality live audio/video stream to your network wirelessly over 802.11g - viewable from anywhere
Full-in stand-alone web server, no PC necessary
Security Mode automatically sends email alerts with video clips upon motion detection
Supports up to four simultaneous remote users

5 PORT 10/100 SWITCH SD205



- Five autosensing 10/100 switched ports with auto MDI/MDI-X crossover detection
- Up to 200Mbps full duplex bandwidth at each port
- Compact size fits into any environment -- includes wall-mount slots
- Address Learning and Aging, and Data Flow Control for enhanced transmission reliability

5 PORT 10/100/1000 GIGABIT SWITCH SD2005



- Five 10/100/1000Mbps, half/full duplex, switched ports
- Forwards and filters packets at non-blocking, full wire speed
- All ports have auto speed negotiation and auto MDI/MDI-X crossover detection
- Linksys reliability and limited lifetime warranty

24 PORT 10/100/1000 GIGABIT SWITCH WITH WEBVIEW SRW2024



- 24 autosensing 10/100/1000 full duplex, auto MDI/MDI-X ports
- Two mini GBIC expansion ports for fiber expansion
- WebView remote monitoring and configuration via web browser
- 64 VLANs, 8 port trunking groups, console port, 802.1p CoS support

Rent* \$13.43/wk

S3978

\$1,199

*RENTSMART

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R1359

\$399

L5968

\$55

M1213

\$175

BROADBAND SOLUTIONS FOR HOME & SMALL BUSINESS

ADSL2/ADSL2+

The NB5 Range of ADSL/ADSL2+ modem routers are the future proof ADSL range of modem and routers that you need to activate, operate and share a broadband ADSL Internet service today and into the future.

NB5 ADSL2/ADSL2+
ETHERNET MODEM
ROUTER

USB port and single port 10/100 ethernet connection which can connect a single computer or is easily extended with a separate switch for multiple users.

*Firmware for upgrade to ADSL2/ADSL2+ available via download.

P7335

\$125NB5PLUS4 ADSL2/ADSL2+
READY MODEM ROUTER WITH
4 PORT SWITCH

USB port and a 4 port 10/100 switch that can easily connect multiple wired users.

S1159

\$159NB5PLUS4W ADSL2/ADSL2+
READY MODEM ROUTER WITH
4 PORT SWITCH AND 11G
WIRELESS

USB port, 4 port 10/100 switch and 11g Wireless Access Point that will easily connect multiple wired and wireless users.

S1160

\$199

PLEASE NOTE:
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Not all items stocked in store but available for pick-up/delivery.

FOUR-PORT ADSL MODEM
ROUTER NB4

- Includes active firewall, 4 port 10/100 switch and VPN pass-through
- Has automatic Port Forwarding function for online gaming and P2P file sharing
- One of the easiest modem routers to install – only two steps needed

S0330

\$125USB VoIP PHONE
WITH SERVICE
PROVIDER
BUNDLE
LSV40[^]

- Ideal for business travellers to benefit from huge savings in long distance calls
- Includes connection to VoIP service MyNetFone
- Installs in three simple steps
- Compatible with PC only

[^]Products use NetComm hardware and include \$5 credit for use with VoIP service from MyNetFone.

R8885

\$99BROADBAND WIRELESS
ROUTER FOR CABLE/ADSL
NB620W

- 2 USB ports including print server
- Advanced broadband wireless connectivity
- Up to 54Mbps (compatible with 802.11g/b wireless)
- Built-in 4 port 10/100 Base-TX ethernet switch.

Q4600

\$269HOME PLUG - ETHERNET OVER
POWER ADAPTOR KIT
NP210HOT NEW
PRODUCT

NetComm HomePlug is an Ethernet over power adaptor that allows you to network up to 15 devices using your home or office power supply. Simply plug the NetComm HomePlug into a power point and connect your device with an Ethernet cable - it really is that easy!

[^]Note: All home plugs must be on the same power circuit.

R9904

\$189VoIP ANALOGUE TELEPHONE
ADAPTOR (ATA) WITH SERVICE
PROVIDER BUNDLE
V100LS[^]

- Designed to connect a standard telephone handset.
- Delivers quality, reliable, real-time Internet voice call
- Ideal for residential and small business users
- Can significantly reduce long distance call charges.

[^]Products use NetComm hardware and include \$5 credit for use with VoIP service from MyNetFone.

R6466

\$129802.11G WIRELESS 4 PORT
MODEM/ROUTER+ VPN
NB5580W

- ADSL Modem with integrated router and 802.11g wireless access point
- Wireless Encryption WEP 64bit & 128bit, upgradeable to WPA
- Supports up to 5 VPN end points.

L8433

\$239

QUANTUM PROTECTS YOUR DATA & YOUR BUDGET!

is the most valuable asset your business owns. Without it, people sit idle, your network is inoperable, and business goes dark. Every minute and every megabyte has a cost. Are you fully protected? Quantum protects the world's mission-critical data with simple, scalable storage solutions from the desktop to the centre.

BACKUP BASICS

TAPE DRIVES

From entry-level to enterprise, Quantum tape drives are inexpensive devices to protect your data



QUANTUM DAT-72

INTERNAL TAPE DRIVE, ULTRA2 SCSI, BLACK

QUANTUM SDLT 600

INTERNAL TAPE DRIVE, SCSI 160, BLACK (TR-S)



Most cost effective tape solution for small to medium-sized businesses, DAT-72 has 72GB of compressed storage and is backward compatible with DDS-3 and DDS-4.

Rent* \$17.20/wk

Featuring an unprecedented 72MB/s compressed transfer rate and a colossal 600GB of compressed storage, there's never been anything quite like it.

Rent* \$65.86/wk

1591 **\$1,100**

Q9119 **\$7,399**

QUANTUM LTO-3

INTERNAL TAPE DRIVE, ULTRA SCSI LVD, BLACK

TAPE AUTOLOADER

Quantum autoloaders hold up to 16 tapes and automate tape rotations saving manual time and increasing backup reliability.

QUANTUM VALUELOADER WITH LTO-2



Offering up to 800GB capacity on a single cartridge backup speeds of up to 490GB/hr, CL 800 is backward compatible to LTO-1.

Rent* \$83.84/wk

In comparison to stand-alone tape drives, the ValueLoader(tm) offers increased capacity and random access to several cartridges without human intervention - the number one cause of data loss.

Rent* \$93.99/wk

2191 **\$8,999**

P7197 **\$9,999**

QUANTUM MEDIA

Quantum now offers a full line of media from DLT tape media, to LTO Ultrium, DAT and DDS data cartridges depending on your specific media requirements. Call Harris Technology's storage specialists on 1300 13 9999 for the full range of Quantum data protection solutions.

QUANTUM TAPE MEDIA

DLT TAPE IV

CompacTape IV (20/40,35/70&40/80GB) DLT Tape
71231 **\$99**

QUANTUM SDLT1

SDLT1 Tape (110/220GB&160/320GB)
B9825 **\$79**

QUANTUM SDLT2

Media for the SDLT600
N4918 **\$179**

CALL HARRIS TECHNOLOGY ON 1300 13 9999 FOR ASSISTANCE WITH DETERMINING THE BEST SOLUTION FOR YOUR DATA NEEDS.



COPY OF "BACKUP BASICS" AVAILABLE FOR DOWNLOAD ONLY AT QUANTUM.HT.COM.AU

QUANTUM WARRANTY

Available for all models. 3-year rapid exchange warranty with telephone & online support available for all models. On-site installation and on-site service optional.

TERMS & CONDITIONS
4-year warranty now available with Quantum. Call Harris Technology on 1300 13 9999 for further information about purchasing an additional year rapid exchange warranty.

*RENTSMART

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POWER BACK-UP EQUALS POWER PROTECTION

ESSENTIAL SURGEARREST



- Single outlet
- Always on Outlets
- Fail Safe Mode
- Lightning and Surge Protection
- Lifetime equipment protection policy up to \$75,000 with Data Recovery Warranty

R1891 P1-AZ **\$18**

ESSENTIAL SURGEARREST



- Featuring 5 outlets
- Lifetime equipment protection policy up to \$75,000 with Data Recovery Warranty

R1893 P5B-AZ **\$39**

HOME/OFFICE SURGEARREST



- Featuring 6 outlets Tel/Fax/Modem
- Lifetime equipment protection policy up to \$125,000 with Data Recovery Warranty

R1889 PH6T3-AZ **\$65**

PERFORMANCE SURGEARREST



- Featuring 8 outlets Tel/Fax/Coax/Network protection
- Lifetime equipment protection policy up to \$175,000 with Data Recovery Warranty

R1884 PF8VNT3-AZ **\$89**

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BACK-UPS ES 350/500



Affordable battery backup

APC Back-UPS ES 350/500 is an affordable battery backup to provide continued uptime and hardware protection for home and home office. Three battery and surge, two surge only outlets, phone, modem, fax and DSL data line surge protection, computer interface port for USB communications and ships with file saving and auto-shutdown software. 2 year manufacturer warranty.

Ideal for:



BACK-UPS ES 350VA

E1093 **\$199**

BACK-UPS ES 500VA

E0709 **\$279**SMART-UPS USB
WITH POWERCHUTE BUSINESS EDITION

Power protection for mission-critical applications

- LED status display with on-line, on battery, replace battery and overload indicators
- Auto Diagnostic Testing
- Automatic Voltage Regulation (AVR)
- CellGuard intelligent battery management
- Network-grade line conditioning



SMART-UPS 1000VA 2U RACK MOUNT WITH POWERCHUTE BUSINESS EDITION Rent* \$15.68/wk

S1372 **\$1,399**

SMART-UPS 1500VA 2U RACK MOUNT WITH POWERCHUTE BUSINESS EDITION Rent* \$23.52/wk

S1373 **\$2,099**APC BACK-UPS CS
FOR WORKSTATIONS

Rear view

Best Value Battery Backup & Protection for Home and Business Computers

- Battery powered & surge protected power outlets
- Built-in phone/fax/modem line (DSL compatible) protection
- Safe system shutdown software
- Sophisticated power management features
- Easy access hot-swappable, user-replaceable battery

APC BACK-UPS CS 350VA/210W 230V

C5446 **\$15**

APC BACK-UPS CS 650VA/400W 230V

Q7196 **\$23**

BACK-UPS HS 500VA 230V

APC Back-UPS HS 500 is a complete management and power protection solution for structured wiring and home networking applications. It provides the flexibility to remotely manage the UPS and control the outlets via Web browser.

Features

- Audible alarms
- Automatic self-test
- Battery replacement without tools
- Cold-start capable
- Cord management
- Dateline surge protection
- Hot-swappable batteries
- LED status indicators
- Network manageable
- Transformer-block spaced outlet



S1244

\$21

TELLIGENT KVM SOLUTIONS

SERVERLINK IP REMOTE ACCESS DEVICE

Access your servers from anywhere in the world! The ServerLink IP allows network administrators to manage, configure, troubleshoot and even reboot remote servers from any web browser. Businesses can now increase productivity by minimising downtime and reducing travel costs and expensive service calls.

Security for your sensitive data is assured using 128 bit Secure Sockets Layer (SSL) encryption with an MD5 and encrypted login screen. The ServerLink IP allows you to connect directly to servers at the BIOS level and is compatible with most existing KVM switches.

If you have an existing KVM switch and are looking for secure, affordable remote access, then order your ServerLink IP today.

Browser-based access from any location
No expensive proprietary software or licensing required
128 bit SSL encryption ensures secure remote connection
Network administrators can reboot remote servers
Low Bandwidth Consumption allows operation over a dial-up connection
Usage tracking technology Auto-Corrects remote session synchronisation errors
Easy upgradeable for quick updates



Rent* \$10.81/wk

\$965

5544

SERVERLINK LCD KVM RACK DRAWERS

ServerLink KVM Console drawers are designed for applications where space is at a premium or CRT displays are undesirable. With a 15" or 17" TFT LCD screen, keyboard, touchpad and integrated KVM switch housed in an industry standard 19" 1U-height rack drawer, these LCD KVM switches save you up to 1/3 of valuable rack cabinet space.

Connect the ServerLink LCD Rack Drawer to any existing KVM switch and increase your server management capacity. The unique modular design means the Snap-In KVM Switch Modules can be interchanged at any time, allowing easy expansion as your server room grows. You can also cascade additional KVM switch modules to control up to 136 servers.

Modular design allows for easy expansion
Grade 15" or 17" LCD panel with zero dead pixels
Latching mechanism locks the drawer when pulled out and pushed in
Keyboard and mouse can be hot plugged at any time
Standard PC99 colour coded connectors for PC connection
Replaceable Keyboard and Touch Pad
Standard 19" 1U rack drawer
Also available in 16 port



17" LCD ALSO AVAILABLE

INCLUDES ALL 2 METRE CABLES

Rent* \$24.81/wk

\$2,399

12100 SINGLE PORT PS/2 - 15" LCD

Rent* \$27.91/wk

\$2,699

12101 8 PORT PS/2 - 15" LCD

SERVERLINK ELITE KVM SWITCHES



The ServerLink Elite KVM switches allow you to control your servers with a single keyboard monitor and mouse. Using high-density connections, these 8 and 16 port switches use only 1U of rack space making them the ideal choice for any server room where space is at a premium.

8 PORT ELITE KVM
Including: 8 x 2m Cables

Rent* \$7.83/wk

\$699

16 PORT ELITE KVM
Including: 16 x 2m Cables

Rent* \$11.19/wk

P2748

SERVERLINK STAR KVM CABLE



Control two PCs with a single keyboard, monitor and mouse. All ServerLink Star KVM switches have audio and microphone support for multimedia applications.

2 PORT PS/2 KVM

Q5539

\$79

2 PORT USB KVM

Q5540

\$89

2 PORT PS/2+USB KVM

Q5541

\$85

*RENTSMART

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BELKIN ACCESSORIES

WIRELESS (RF) KEYBOARD & OPTICAL MOUSE BUNDLE



- Slender design, easy to connect
- 14 hot keys for one-touch access to the Internet and multimedia functions
- Works seamlessly for right and left hand users
- 2 convenient LEDs for keyboard and mouse usage

K8276

\$59

USB 4 PORT ECONOMY HUB



Rear view



Add four USB devices to a single USB port; also additional hubs can be stacked for endless daisy-chaining expansion. Easily connects into your PC's USB port.

Advantages:

- Fast 12Mbps data rate
- Quick, easy Plug-and-Play installation
- Five lights indicate power and port status
- Fully compatible with Windows® 95 OSR2, Windows® 98, Windows® 2000 and Mac® OS 8.1 or higher

D5950

\$29

PLEASE NOTE:

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USB 2.0 HI-SPEED DRIVE ENCLOSURE



- Adds additional storage space to your computer
- Changes your internal hard drive or CD/DVD RW into a portable drive
- Ideal for loading large files or transferring data between computers
- Supports a maximum drive size of up to 250GB

R1646

\$89

USB 2.0 DOCKSTATION



- Connects all your peripheral devices to one hub using only 2 cables
- One VGA pass-through port for monitor connection, and one RS232 serial port
- Saves space on your desktop
- Provides easy to reach port access

M2749

\$99

BELKIN MINI USB GLO MOUSE WITH RETRACTABLE CORD



- Features a retractable cord for tangle-free storage
- Radiates attractive color-changing band of light and scroll wheel
- Flexible, left or right-handed comfort
- Provides optical precision at 800dpi
- Covered by Lifetime Warranty

R9475

\$33

USB 2.0 7 PORT HUB

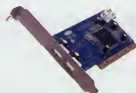


- 2 top loading ports for Bluetooth or Flash Drive access
- Stackable design allows 2 hubs on top of each other
- Slimline, functional look with Plug-and-Play usability
- Lowers power consumption for longer battery life

M3000

\$68

USB 2.0 3 PORT PCI CARD



- Includes driver installation CD and user manual
- Installs easily into a free PCI slot
- Comes with Belkin's Lifetime Warranty and free technical support
- Provides 2 easily accessible 480Mbps USB 2.0 ports

H2242

\$37

CLASSIC KEYBOARD BLACK USB ONLY



- "Quiet-Type" Soft key technology
- One-touch access with hotkeys
- Menu "Start" and pull-down hot keys
- USB port connection
- Covered by Lifetime Warranty

Q7609

\$14

USB 2.0 4 PORT HUB

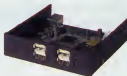


- Self-powered, allowing 4 downstream ports
- Reversible design for front or back use of desktop use
- Allows cascading, up to 127 devices to a single port
- LEDs for master power and individual ports
- Connects up to 2 high-speed devices without power

M3731

\$6

USB 2.0 4 PORT DRIVE BAY - DARK GREY



- Fits in a 3.5" drive bay to provide USB 2.0 ports
- Features 1 upstream and 4 480Mbps downstream ports
- 4 LEDs to indicate port status
- Comes with Belkin's Lifetime Warranty and technical support

S4145

\$5

WIRELESS KEYBOARD & OPTICAL ERGO MOUSE BUNDLE



- Slim profile design with adjustable height option
- One-touch access with hotkeys
- One-button Power management key for sleep, wake-up and log-off
- Volume adjustment knob
- Features foldaway wrist rest for comfort & flexibility

N0658

\$8



harristech technology



Networking

ENTERPRISE-CLASS NETWORKING AT AN AFFORDABLE PRICE

SUPERSTACK 3 SWITCH 3870 WITH BONUS TFT MONITOR



3Com SuperStack 3 Switch 3870 24 port is a wire-speed "Gigabit to the desktop" switch with integrated 40Gbps stacking of up to eight units. For flexibility, four of the ports are dual-personality, operating either as 100/1000 or SFP-based fiber. Enterprise-class security features include 802.1X network login, SSH/SSL encrypted device log-in, and access control lists. This future-proof solution has a 10Gbps capacity expansion slot and multilayer-capable silicon.



BONUS
SAMSUNG
17" OR 19"
TFT SCREEN*

Rent* \$35.48/wk

7596 24 PORT SWITCH WITH BONUS SAMSUNG 17" TFT MONITOR

\$3,575

Rent* \$49.60/wk

7597 48 PORT SWITCH WITH BONUS SAMSUNG 19" TFT MONITOR

\$5,375

SUPERSTACK 3 SWITCH 4200 FAMILY



4226T

The 3Com SuperStack 3 Switch 4226T is a 26 port fixed configuration 10/100 LAN switch for networks requiring the latest technology at a reasonable price. With 24 10/100 ports and two built-in copper Gigabit ports for stacking or downlinks, this switch offers rich Layer 2 features including wire-speed performance, 802.3ad Link Aggregation (LACP), Rapid Spanning Tree Protocol, and Advanced Redundant Power Supply support. It's fully stackable with other Switch 4200 family devices, up to four units high.

Rent* \$6.71/wk

F8996

\$599

4228G

The SuperStack 3 Switch 4228G is a 28 port 10/100 LAN switch for networks requiring the latest technology at a great price. With 24 10/100 ports, two copper Gigabit ports for stacking or downlinks, and two GBIC slots for additional Gigabit connections, this switch offers rich Layer 2 features including wire-speed performance, 802.3ad Link Aggregation (LACP), Rapid Spanning Tree Protocol, and Advanced Redundant Power Supply support. Stack with other Switch 4200 devices up to four units high.

Rent* \$7.83/wk

J5281

\$699

3COM® OFFICECONNECT® CABLE/DSL GATEWAY

Economically Share One Broadband Internet Connection.

The 3Com® OfficeConnect® Cable/DSL Secure Gateway lets small offices, branch offices, and home offices benefit from reliable and cost-effective shared Internet access. Up to 253 users can securely share a single cable or DSL connection.

The gateway offers a 4 port 10/100 Ethernet LAN switch, plus an Ethernet WAN port for connecting to a broadband modem (not included). Robust IP addressing and authentication functions deliver router-like features at an attractive price.

3COM OFFICECONNECT WIRELESS B GATEWAY/ROUTER + 4 PORTS

Share One Broadband Internet Connection with Wireless and Wired Users.

The 3Com® OfficeConnect® Wireless Cable/DSL Gateway is an affordable and easy-to-use small office solution that lets wireless and wired PCs and laptops securely share a single broadband Internet connection.

Specially designed for small offices, branch offices, and home offices, this gateway router combines an integrated 802.11b Wi-Fi-certified wireless access point and a 4 port 10/100 Ethernet switch. Up to 253 (32 wireless) users can share access to a single cable or DSL modem (not included).

N4335

\$79

K0587

\$179

Purchase a 3Com 24 port or 48 port SuperStack 3 Switch 3870 and receive a bonus (17" OR 19") TFT monitor. Promotion period begins 1/4/05 and ends on 31/7/05.

*RENTSMART

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USB - STORAGE & CONNECTIVITY

COMSOL USB 2.0 FLASH DRIVES



- Hi-Speed USB 2.0 Certified
- Password security feature
- True Plug & Play
- PC & Mac compatible

S3103 256MB **\$59**S3104 512MB **\$89**S3105 1GB **\$159**

COMSOL USB 2.0 QUICKLINK 5-IN-1 CABLE



QuickLink Connectors for all your USB devices. Complete with 2 metre cable & easy carry pouch. Five Different USB Cable Configurations

- A Male to B Male
- A Male to A Female
- A Male to Mini B Male
- Mini A Male to B Male
- Mini A Male to Mini B Male

P9191 **\$29**

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

COMSOL USB VOIP PHONE

This fully-featured USB VoIP Phone allows you to talk to friends or colleagues just like a normal telephone. Used in conjunction with Skype or similar software, it offers you a complete free Internet telephony solution. The UVP-001 features simple plug-and play installation, integrated LCD and keypad, echo cancellation and noise reduction.

- Talk to friends or colleagues just like a normal phone
- Provides a complete free Internet telephony solution
- SKYPE ready - talk for free with other Skype users
- Works with most leading VoIP providers
- Make huge savings on local, standard and international calls
- Ideal for the mobile traveller
- Allows PC-to-PC and PC-to-phone operation
- LCD display, keypad and ringer
- 10 programmable ring tones for incoming calls
- Echo cancellation and noise reduction
- Independent use of phone and sound card allows for VoIP call whilst listening to music
- Caller ID function of VoIP calls



C5200

\$89

COMSOL USB 2.0 CARD READER 17-IN-1

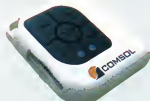
- Hi-Speed USB 2.0 Certified
- Supports almost all of the available storage cards including: SD, Mini SD, SD Ultra II, MMC 1, MMC 2, RSMC, MicroDrive, CF I, CF II, CF-Ultra II, CF-Extreme, MS, MS Pro, MS Pro Duo, MS Pro (MG), MS Pro Duo (MG), TransFlash.



R5964

\$49

COMSOL SD CARD READER + MP3 PLAYER



- Combined SD Card Reader + MP3 Player
- Store and transfer all your digital files
- Hi-Speed USB 2.0 certified
- Supports SD, MMC & RSMC storage cards (not included)
- High Quality MP3 file playback

R9652

\$59

COMSOL 4 PORT USB 2.0 MINI HUB



- Hi-Speed USB 2.0 Certified
- Ultra compact for portability
- Ideal for mobile notebook users
- Transfer speeds up to 480Mbps

S1276

\$34



CD/DVD PRODUCTION

BURN ONLY

PSYSMARTBLAST DVD DUPLICATORS

evoccept

- Burn discs fast with these speedy stand alone duplicators
- Up to 16x DVD with DL support
- Ranging from 3 to 7 drives simultaneously burning
- Built-in 120GB Hard Disk with new USB 2.0 PC connection for image management

HOT PRICE!

only models also available.

Rent* \$15.68/wk

2085 3 DVD±R

\$1,399

Rent* \$21.28/wk

2086 5 DVD±R

\$1,899

Rent* \$24.64/wk

2087 7 DVD±R

\$2,199

BURN & PRINT

360i DUPLICATE PRINT



RIMAGE™

- Totally automated and easy to install and use
- One DVD/CD burning drive & 4800dpi printer
- 25 Disc Capacity
- Powerful, intuitive wizard based software
- World class Rimage quality

Rent* \$40.82/wk

S1146 1 DVD±R DRIVE

\$3,999

BURN & PRINT

AVOPRO DISC PUBLISHER



PRIMERA TECHNOLOGY, INC.

BravoPro
DISC PUBLISHER

Professional, all-in-one CD/DVD publishing on your desktop
Totally automated and hands free
Burning Drives & 4800dpi printer
Afterburner Print Technology for fastest throughput in its class
100 disc capacity
Networking software included
PC and Mac platform software included

Rent* \$48.90/wk

Q9576 2 CD-R

\$5,299

Rent* \$55.36/wk

Q9577 2 DVD±R

\$5,999

RIMAGE 2000i CD AND DVD PUBLISHERS



RIMAGE™



- 2 drives CD or DVD
- Totally automated and hands free
- 100 disc capacity
- Incorporates 480i CD/DVD Printer
- Duplication and Publishing capability
- Network software supports PC or MAC clients
- Up to 2 units on one PC
- Plug and Play

Rent* \$53.51/wk

N2212 2 CD-R

\$7,999

Rent* \$59.97/wk

N2213 2 DVD±R

\$6,499

DISC SHREDDER



PRIMERA TECHNOLOGY, INC.

DS360 DISC SHREDDER

- Shred and Destroy CDs and DVDs!
- Heavy Duty
- Auto start/stop & reverse
- Easy to empty wastebasket
- Shreds CDs, DVDs, credit cards and folded paper

S3475

\$199

SPIN CD/DVD



evoccept

Direct to disc printing that's fast, easy and inexpensive

- Single colour thermal printer
- Prints direct to disc
- Unique 4 x 90 degree rotation function supports 4 separate print areas
- Ideal for simple text and logos

M5461

\$179

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

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STORAGE SOLUTIONS

EXTERNAL
LIGHTSCRIBE DVD
BURNER USB2.0 &
FIREWIRE

- DL DVD+R 2.4x
- DVD+/-RW 4x
- DVD+R 16x
- CD-R 40x
- DVD-R 8x
- CD-RW 32x

The great LaCie d2 DVD±RW Drive is now available with LightScribe, an innovative new HP technology that allows for burning professional quality labels for CDs and DVDs without the hassle of a printer.

The very same laser that burns data onto discs can now also burn a precise, iridescent image directly onto your CDs and DVDs. Its that simple - just burn your disc, flip it over, and then burn the label. Compatible discs contain a thin dye coating finish that reacts to laser light in a chemical reaction, leaving a silkscreen-like image. Create your own fabulous custom designs with crisp text, graphics and photos, which you can add to again and again.

- Easily burn labels when ever discs are burned
- Convenient - no need for a printer
- Professional quality laser precision and detail

R4036

\$339***RENTSMART**

The figures quoted are per week basis over 3 years. Terms and conditions apply.

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Porsche EXTERNAL
MOBILE DRIVES
USB 2.0 & FIREWIRE

NB: The key is not included

LaCie mobile drives, designed by FA Porsche, are the perfect companion to back up your notebook or use to transfer data from one computer to another. Made of magnesium and bus powered through the USB 2.0 & firewire port. Weight only 200g and is 1.7 x 7.6 x 1.3cm in size.

BENEFITS

- Ultra-lightweight, portable design
- Hi-Speed USB & FireWire interface
- AC adapter free - powered by USB drive

SPECIFICATIONS

- Interface: Hi-Speed USB & FireWire
- Interface Transfer Rate: 480Mbps/s
- Rotational Speed (rpm): 5400
- Size: 1.7 x 7.6 x 1.3cm / .65 x 3 x .5 in. (HxWxL)
- Weight: 200g / 7.05 oz.
- Seek Time: <12 ms
- Buffer: 2MB (40GB) 8MB (60, 80 & 100GB)

**40GB Porsche EXTERNAL
USB 2.0 & FIREWIRE MOBILE DRIVE**

S2458

\$233**60GB Porsche EXTERNAL
USB 2.0 & FIREWIRE MOBILE DRIVE**

S2459

\$299**80GB Porsche EXTERNAL
USB 2.0 & FIREWIRE MOBILE DRIVE**

S1929

\$366**100GB Porsche EXTERNAL
USB 2.0 & FIREWIRE MOBILE DRIVE**

S2411

\$486

d2 EXTERNAL HARD DISK DRIVE



LaCie d2 drives have been designed for professional users in mind. Beyond the fact that they are robust, lightweight, fast cooling and noise free, these drives have unique features such as Kensington cable lock slot, autoswitch power on/off with your computer and are rackmountable in 19" rack.

BENEFITS

- Zamac alloy for fast cooling & robustness
- FireWire 800 for fast transfer rate
- USB & FireWire for convenience
- Rackmountable
- Kensington keylock for security
- Autoswitch on/off

SPECIFICATIONS

- Buffer size: 8MB
- Rotational speed: 7200rpm
- Seek time < 10ms
- Plug & play on Mac OS X & Windows XP
- Compatible with Mac OS 9.x & 10.x, Windows XP & 2000

**250GB d2 EXTREME
USB/FIREWIRE/FW800**

Q0363

\$471**500GB d2 BIGDISK
USB/FIREWIRE/FW800**

Rent* \$8.73

M1506

\$771**1000GB d2 BIGGERDISK
USB/FIREWIRE/FW800**

Rent* \$17.25

M2819

\$1,539**2000GB d2 BIGGERDISK EXTREME
FIREWIRE/FW800**

Rent* \$39.80

S3231

\$3,899

^ Total access capacity varies depending upon operational environment



C, NETWORK & SERVER STORAGE SOLUTIONS

MAXTOR ONETOUCH II SMALL BUSINESS EDITION SERVER
BACK UP - 200GB NATIVE / 300GB COMPRESSED*

SIMPLE BACKUP FOR A SMALL BUSINESS SERVER

Designed for the small business, the **Maxtor OneTouch II, Small Business Edition** installs easily and includes a simple card interface for setting up unattended, automated backup schedules, drive management, security and backup settings, and file restoration.

Specifically developed for the small business server, comprehensive backups include operating system, settings, spreadsheets, applications, databases, address books, emails, documents and even open files!

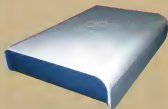
You can even receive status updates via email or a simple desktop icon, and know that your backup is working - wherever you are.

*Compression assumes 3:2 compression ratio.
Actual compression may vary dependent on type of data.



NEW!

Rent* \$8.95/wk

\$799MAXTOR PERSONAL
STORAGE 3100THE EASY ECONOMICAL WAY
TO ADD STORAGE

The Maxtor Personal Storage 3100 external hard drive provides instant storage to hold digital photos, music and data files. Ideal for the home and office, it's simple to install - just plug the external drive into an available USB port on your Windows PC and immediately get up to 80GB of extra space. Use the extra capacity to free up the space on your PC or to add more of your favorite files - the 80GB drive can hold up to 75,000 digital photos (JPEG normal) or up to 1650 hours of digital music (MP3).

The Personal Storage 3100 offers a dependable Maxtor hard drive for easy add-on storage to hold your important documents and precious memories. It works with both the fast USB 2.0 interface and USB 1.1.

FEATURES

- Easy installation
- USB 2.0 & 1.1 compatible
- USB 2.0 up to 40 times faster than USB 1.1
- Compact Design
- Powered by a dependable Maxtor® hard drive
- Windows PC compatible

R3509 80GB

\$149

*RENTSMART

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PLEASE NOTE:

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MAXTOR SHARED STORAGE
DEVICE

USB ports let you add shared network printers or external storage

Access files from multiple PCs simultaneously
You can set access privileges and keep selected folders private

With Maxtor exclusive Drag and Sort™ technology, you can instantly organise files by dragging them from your desktop PC to the Maxtor Shared Storage Drive
With its sleek, anodised aluminium shell and compact size, the Maxtor Shared Storage Drive easily fits anywhere in your home or small office

1 year warranty

MAXTOR ONETOUCH II™ - SMART
STORAGE WITH PUSH-BUTTON
BACKUP

Just press the button and your files are backed up in one simple step. Faster than CD. Faster than a floppy. Faster than removable cartridge systems. Space for your photos, videos, graphics, music, documents and more. It connects to FireWire or USB ports on a PC or MAC. It backs up with the Maxtor OneTouch™ button or runs automated backups using the included software, Dantz® Retrospect® Express. And you can customise the button to launch any application. Powerful, yet simple backup. Fast, flexible, huge capacity.

R3323 100GB (USB 2.0)

\$229

R3322 200GB (USB 2.0 + FIREWIRE)

\$349

Q3145 250GB (USB 2.0 + FIREWIRE)

\$399

Q3146 300GB (USB 2.0 + FIREWIRE)

\$449

R7907 200GB (USB 2.0)

\$449

Q1270 300GB (USB 2.0)

\$549

SEAGATE EXTERNAL HARD DRIVES

5GB POCKET
HARD DRIVE USB 2.0

The Seagate 1" external hard drive is the biggest small hard drive on the planet, with up to 5GB capacity. Breaking traditional cost/performance barriers, this innovative solution is available in a cool looking, USB 2.0 bus powered design. This 1" external drive is optimised to deliver high performance, low power consumption and reliability in a compact physical package.

APPLICATIONS

- Robust design and high shock tolerance enable mobility in demanding operating environments
- Best solution for highly portable data transfer
- Great for carrying music, photos and business files
- One year manufacturer warranty

Q3001

\$249

RENTSMART

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EXTERNAL HARD DRIVE 3.5"
7200 RPM FIREWIRE/USB 2.0

HIGH CAPACITY, AMAZING PERFORMANCE

These high capacity drives make it easy to store and backup your data. You can safely store business files, movies and photos, the latest games, your favourite music and more. And the interlocking design lets you securely expand your Seagate storage.

ENGINEERED FOR HIGH PERFORMANCE

7200 RPM drive with 8MB cache and whisper quiet motor lets you effortlessly store and work with massive amounts of data.

BUILT FOR SAFETY AND SECURITY

Seagate hard drives are safeguarded by built in self monitoring technology that continuously checks your hard drive for data safety and drive performance. SeaTools diagnostic software is included.

WORRY FREE, ONE YEAR WARRANTY

Warranty covers all parts and labour.

DRIVE SPECIFICATIONS

- 8MB cache
- 7200 RPM
- 350 Gs non-operating shock resistance
- Mac and PC compatible

R7927 160GB (USB 2.0 Only) **\$279**R3677 200GB (USB 2.0+Firewire) **\$349**R3678 300GB (USB 2.0+Firewire) **\$449**

Rent* \$6.71/wk

R3679 400GB (USB 2.0+Firewire) **\$599**PORTABLE DRIVE 2.5"
EXTERNAL 5400 RPM USB 2.0

EXCEPTIONAL PORTABILITY AND PERFORMANCE

Enjoy easy storage and access of large digital music, photos, video, data and multimedia files both on the desk and on the go.

ENGINEERED FOR HIGH PERFORMANCE

This 5400 RPM hard drive features a whisper quiet SonicSoft FDB motor, and delivers 50 percent more performance than 4200 RPM drives - with no increase in power consumption. You get higher speed while conserving battery life.

FAST AND EASY

Supports speeds up to 480Mbps, is hot swappable and powered by the USB bus - there's no need for power cords or adapters.

BUILT FOR SAFETY AND SECURITY

Seagate hard drives are safeguarded by built in self monitoring technology that continuously checks your hard drive for data safety and drive performance. SeaTools diagnostic software is included.

WORRY FREE, ONE YEAR WARRANTY

Warranty covers all parts and labour.

DRIVE SPECIFICATIONS

- 2MB cache (40GB) / 8MB cache (100GB)
- 5400 RPM
- 5000 Gs non-operating shock resistance
- Mac and PC compatible

R3680 40GB **\$249**R3682 100GB **\$499**

SanDisk 

PERSONAL STORAGE

SANDISK CRUZER MICRO USB
FLASH DRIVES

This small USB flash drive allows you to easily store key documents, pictures, music and video clips and transfer them to another computer via a USB port.

SANDISK COMPACT FLASH
CARDS TYPE 1

This popular storage device has a high transfer rate and operating shock rating of 2,000Gs. As the inventor of this product, SanDisk has led the market for Compact Flash since its inception.

SANDISK ULTRA II COMPACT
FLASH CARDS TYPE 1

These cards offer faster speeds and superior performance, with a minimum sustained write speed of 9MB per second and a read speed of 10MB per second.

SD0698	256MB	\$49
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D5310	256MB	\$42
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SD0699	512MB	\$85
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J0492	512MB	\$79
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J0506	512MB	\$99
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SD2289	1GB	\$149
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E8511	1GB	\$135
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M6255	1GB	\$169
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SD2290	2GB	\$299
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P5253	2GB	\$270
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N9758	2GB	\$324
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SANDISK SECURE DIGITAL
CARDS

The SD card is a highly secure flash memory card which can be used in a variety of digital products including digital cameras, digital video recorders and smart phones.

SANDISK ULTRA II SECURE
DIGITAL CARDS

SanDisk's Ultra II range and optimised flash cards that have a write speed of 9MB per second and a read speed of 10MB per second delivering superior speed. Ideal for Digital photography.

SANDISK MEMORY STICK PRO



The perfect solution to capture data that requires high performance, fast data transfer (15Mbps) and advanced security (Access Control Function and MagicGate™ technology).

SD3995	256MB	\$59
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L7457	256MB	\$74
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SD3944	512MB	\$89
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N5441	512MB	\$99
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P7447	512MB	\$106
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SD7731	1GB	\$159
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R3303	1GB	\$177
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P7448	1GB	\$197
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MP3 PLAYERS



A small, portable player that uses embedded flash memory instead of a rotating hard drive and plays for up to 15 continuous hours on a single AAA battery (included). The new Digital Audio Players combine crystal-clear sound with a sleek design and sport a three-button/one-joystick design and easy-to-navigate user interface.

Features:

- Plays MP3, WMA, and WMA DRM
- Digital FM tuner with 20 preset stations
- Voice Recorder with built-in microphone
- Hi-Speed USB 2.0 port for fast and easy transfer of files
- Indigo backlit multi-line LCD display

R7171	RED	256MB	\$139
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R7172	BLUE	512MB	\$199
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R8753	SILVER	1GB	\$249
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PLEASE NOTE:

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ULTRA PORTABLE PROJECTORS

DIGITAL STILL CAMERAS

Cyber-shot
MEMORY STICK PRO

DSC90S



NEW!

- 4.2 Mega Pixel
- 3x Optical Zoom
- MPEG Movie VX

S0761

\$429

DSCW5S



NEW!

- 5.1 Mega Pixel
- 2.5" Colour LCD
- Carl Zeiss Lens

Rent* \$6.49/wk

R8761

\$579

DSCW7S



NEW!

- 7.2 Mega Pixel
- 2.5" Colour LCD
- Carl Zeiss Lens

Rent* \$8.73/wk

S1280

\$779

*RENTSMART

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BRIGHT IMAGES

GENTLE ON THE EYES

NATURAL COLOUR

- 2 years warranty
- Integrated Speakers

- Password Security Feature
- Ceiling Mountable

- Remote Control supplied
- Carry Case supplied

VPLDS100

BONUS
ITEMS
See table
below

- 1200 ANSI Lumens
- Vertical Keystone Correction
- Hi Definition Capable
- Screen Size up to 300"

Rent* \$17.14/wk

P9989

\$1,530

VPLES2

BONUS
ITEMS
See table
below

- 1500 ANSI Lumens
- Long Lamp Life up to 4000 Hours
- Short Throw Lens
- 6 Picture Mode Settings

Rent* \$20.72/wk

Q9803

\$1,849

VPLCS7

BONUS
ITEMS
See table
below

- 1800 ANSI Lumens
- Advanced Auto Set-Up
- Hi Definition Capable
- Screen Size up to 300"

Rent* \$24.84/wk

P9962

\$2,321

VPLEX1

BONUS
ITEMS
See table
below

- 1500 ANSI Lumens
- XGA Resolution
- Intelligent Auto Set-Up
- Weighs 2.7kg

Rent* \$31.46/wk

J9934

\$2,990

VPLCX70

BONUS
ITEMS
See table
below

- 2000 ANSI Lumens
- XGA (1024 x 768) Resolution
- Intelligent Auto Set-up
- Digital Zoom Function

Rent* \$36.41/wk

P4289

\$3,495

VPLCX75 WIRELESS

BONUS
ITEMS
See table
below

- 2500 ANSI Lumens
- XGA (1024 x 768) Resolution
- Short Focus Lens
- Memory Stick Slot

Rent* \$45.92/wk

P4290

\$4,499

Projector	Bonus Option 1	OR	Bonus Option 2	OR	Bonus Option 3	OR	Bonus Option 4
VPL DS100	2 x CML \$50 vouchers		1 x External DVD Burner				3rd year extended warranty
VPL ES2	3 x CML \$50 vouchers		1 x External DVD Burner		1 x PS2 Console		3rd year extended warranty
VPL EX1	1 x Home DVD Recorder						3rd year extended warranty
VPL CS7	4 x CML \$50 vouchers		1 x External DVD Burner		1 x PS2 Console + Presentation Tool		3rd year extended warranty
VPL CX70	1 x Home DVD Recorder + Presentation Tool						3rd year extended warranty
VPL CX75	1 x Home DVD Recorder + Presentation Tool		5.1MP Digital Camera				3rd year extended warranty

*Bonus items are valid for purchase from 01/07/05 - 31/07/05 and can be redeemed at www.sony.com.au/projectorbonus. CML (Coles Myer Limited) vouchers not redeemable at Harris Technology.

REMOVABLE DATA STORAGE AND SOLUTIONS

NEW ForceField™

roducing Imation CD and DVD media with ForceField Protective Coating. These new discs feature a unique layer of protection that helps guard your CDs and DVDs from just about everything that everyday life can dish out. Fingerprints, scuffs, static charges that can attract dust, even most scratches are no match for the ForceField coating. You can use these discs without worrying about losing your precious memories or valuable data.

IMATION CD-R

ForceField 52X 10 SLIM JEWEL CASE



\$3986

\$10

IMATION CD-R

ForceField 52X 30 PACK SPINDLE

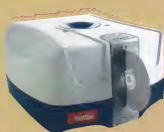


\$2663

\$26

IMATION DISC

STAKKA™



- Perfect for business, studio and home use, with the Disc Stakka you need never waste time searching for a disk again
- Stores, protects and retrieves up to 100 of your favourite CDs or DVDs
- Fully motorised disc insert and eject helps protect your valuable discs
- Simple to set up, linking to your computer via a single USB cable.
- Supplied with powerful OpdiTracker Disc Management Software - use to capture disc content, and then search an entire database of stored discs by title, keyword, directory or file name

IMATION DVD-R

ForceField 8X 5 JEWEL CASE



\$3346

\$10

IMATION DVD+R

ForceField 8X 5 JEWEL CASE



\$3348

\$10

IMATION CD-R

LightScribe™ 52X 10 JEWEL CASE



Image for illustration purposes only

\$2604

\$16

IMATION CD-R

700MB/80MIN INKJET PRINTABLE 50PK SPINDLE



Image for illustration purposes only

\$27712

\$25

IMATION DVD+R

1PK DOUBLE LAYER MEDIA



Image for illustration purposes only

R1517

\$8

IMATION DVD+R

LightScribe™ 8X 5 JEWEL CASE



Image for illustration purposes only

\$3341

\$19

M4871

\$185

IMATION DVD+R 4.7GB

8X DVD+R MEDIA - 10 PACK SLIM MOVIE CASE



\$1266

\$13

PLEASE NOTE:

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IMATION 4.7GB

DVD+R MEDIA - 5 PACK



P2907

\$7

IMATION CD-R

52X 10 PACK WHITE INKJET PRINTABLE



\$1268

\$9

IMATION DVD+R

8X 50PK SPINDLE WHITE INKJET HUB PRINTABLE



Q5595

\$48

LEADERS IN VISUAL DISPLAYS

SAMSUNG EXTERNAL DOUBLE-LAYER DVD±R/RW DRIVE - USB 2.0



Whether it be a mountain of music, a home movie of epic proportions or a lifetime of digital memories, the sky's the limit with Samsung's new dual layer DVD burner.

- Interface: USB 2.0
- DVD+R: write 16x, read 12x
- Double Layer: write 8x, read 8x
- Writemaster Technology:
 - O.P.C. Technology
 - Tilt Actuator Compensation Technology
- SAT (Speed Adjustment Technology)
- A.B.S. Technology
- Magic Speed

S2404

\$169***RENTSMART**

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

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17" TFT MONITOR**SAMSUNG 713N**

- Pixel pitch: 0.264 mm
- Contrast ratio: 600:1
- Viewing Angle (H/V): 160° / 160°
- Response Time: 8 ms
- Analogue interface
- 1280x1024 Maximum resolution
- 3 year on site exchange^A

S1788 SILVER

\$435

S1806 BLACK

\$435

Rent* \$7.38/wk

17" TFT MONITOR**SAMSUNG 173P PLUS**

- Pixel pitch: 0.264 mm
- Contrast ratio: 1500:1
- Viewing Angle (H/V): 178°/178°
- Response Time: 8ms
- Analogue/Digital interface
- 1280x1024 Maximum resolution
- 3 year on site exchange^A

S4209 BLACK

\$659**19" TFT MONITOR****913V**

- Pixel pitch: 0.294mm
- Contrast ratio: 600:1
- Viewing angle (H/V): 160°/150° (CR>5)
- Response time: 12ms
- Analogue interface
- 1280x1024 maximum resolution
- 3 year on site exchange and zero dead pixel policy^A

S4224 BLACK

\$555

Rent* \$6.22/wk

19" TFT MONITOR**913B**

- Pixel pitch: 0.294 mm
- Contrast ratio: 700:1
- Viewing angle(H/V): 160°/160° (CR>5)
- Response time: 8ms
- Analogue / Digital interface
- 1280 x 1024 maximum resolution
- 3 year on site exchange and zero dead pixel policy^A

S4220 BLACK

\$699

Rent* \$7.83/wk

S4584 SILVER

\$699

^APlease contact Samsung Electronics Australia on 1300 362 603 or email: monitor.service@samsung.com for full Terms & Conditions.

ALL PRINTERS
SUPPLIED WITH
BONUS
PRINTER CABLE

SAMSUNG

harristechnology



Printers

QUALITY AND INNOVATION, NO RISK



MONO LASER PRINTER

SAMSUNG ML-1740

- Speed(ppm): Up to 16ppm/A4, Up to 17ppm/Letter
- Resolution 600 x 600 dpi
- Maximum Paper Size: 216mm x 356mm
- Minimum Paper Size: 76mm x 127mm

P2581

\$199



COLOUR LASER PRINTER

SCX-4216F

- 16ppm mono laser multifunction
- Printer/Copier/Colour Scanner/Fax
- Auto document feeder
- 33.6 kbps fax
- Telstra Duet compatible
- 250 sheet tray
- Windows only
- USB & IEEE1284 connectivity

2137

\$399



COLOUR LASER PRINTER

SAMSUNG CLP-550N

- 3 year manufacturer onsite warranty
- Speed: 5ppm (colour), 20ppm (mono)
- Resolution: 1200 dpi max
- RAM (Standard): 128MB
- 10/100BaseTX (ethernet) network card
- Auto-duplexing (the ability to print on both sides of a sheet of paper)
- 250 sheet paper cassette, plus a 100 sheet multipurpose feeder

Rent* \$10.07/wk

P9392

\$899



MONO LASER PRINTER

SAMSUNG ML-2551N

- 3 year manufacturer onsite warranty
- Speed (A4): 24ppm
- Resolution: 1200 dpi max
- Processor: Samsung 266 MHz
- RAM (Standard): 32 MB
- Monthly Duty Cycle: 100,000 pages
- Standard Internet & USB 2.0 interface
- 3 year manufacturer on-site warranty Australia wide

Rent* \$10.74/wk

M4990

\$959

SAMSUNG TONERS

**SAMSUNG TONER FOR ML-1740
3000 PAGE YIELD**

J2380

\$98

**SAMSUNG CLP-500
AND CLP-550N ADDITIONAL 500
SHEET PAPER TRAY**

Q1877

\$ 249

**SAMSUNG ML-2551N OPTIONAL
500 SHEET TRAY**

J9642

\$246

**SAMSUNG TONER FOR SCX-
4216F MFC MACHINE**

J9653

\$99

**SAMSUNG ML-2551N 10,000 PAGE
TONER CARTRIDGE**

L7764

\$235

**SAMSUNG CLP-500 + CLP 550N
BLACK TONER 7000 PAGE YIELD**

M9755

\$139

**SAMSUNG CLP 550 + CLP 550N
CYAN TONER**

M9756

\$155

**SAMSUNG CLP 550 + CLP 550N
MAGENTA TONER**

M9757

\$155

**SAMSUNG CLP 550 + CLP 550N
YELLOW TONER**

M9758

\$155

*RENTSMART

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PLEASE NOTE:

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MONO LASERJET PRINTER SERIES

HP LASERJET 4345MFP SERIES



IDEAL FOR SMB PRINTER, SCANNER, COPIER

- **Print:** up to 43ppm in A4
- **First page out:** 10 seconds.
- **Resolution:** 1200 dpi
- Easy to use touch screen control panel
- **Scan:** Up to 45cpm (letter) / 43cpm (A4)
- **Copy:** Resolution enhanced 600 x 600 dpi

HP LJ 4345MPF Rent* \$41.84/wk
R0332 \$4,099

HP LASERJET 4250 SERIES



- Up to 43ppm in A4
- **Resolution:** 1200 dpi
- 500 sheet tray & 100 sheet multi-purpose tray
- Monochrome laser
- Two open industry-standard CompactFlash slots

HP LJ 4250 Rent* \$19.04/wk
Q3919 \$1,699

HP LJ 4250N Rent* \$23.67/wk
Q2900 \$2,289

HP LJ 4250TN Rent* \$27.91/wk
Q2894 \$2,699

HP LJ 4250DTN Rent* \$34.18/wk
Q2890 \$3,249

*RENTSMART

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HP LASERJET 1320 SERIES



Fast desktop laser printer ideal for small business workgroup or SOHO users

- **Speed:** up to 21ppm in A4
- **Resolution:** 1200 dpi
- **First page out:** 8.5 seconds
- 16MB RAM

P9319	HP LJ 1320	\$709	Rent* \$7.94/wk
P9320	HP LJ 1320N	\$839	Rent* \$9.04/wk
P9321	HP LJ 1320TN	\$989	Rent* \$11.08/wk

HP LASERJET 3030 SERIES ALL-IN-ONE

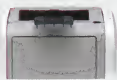


The space-saving LaserJet all-in-one for business

- **Speed:** up to 15ppm (letter) and up to 14ppm (A4)
- **Resolution:** 1200 dpi
- **First page out:** 10 seconds
- 32MB RAM
- FastRes 1200
- **Copier:** 14cpm
- **Fax:** 33.6kbps fax modem
- **Scanner:** 600 x 600 dpi optical
- **Connectivity:** USB & Parallel

M7638	\$699	Rent* \$7.83/wk
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LASERJET 1020



- **Speed:** 15ppm
- **First page out:** 10 seconds
- **Resolution:** 1200 dpi
- **Duty cycle:** 5000 (pages/month)
- **Connectivity:** USB 2.0 high speed

R9102	\$229
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LASERJET 1022 & 1022N



- **Speed:** 18ppm
- **First page out:** 8 seconds
- **Resolution:** 1200 dpi
- **Duty cycle:** 7000 (pages/month)
- **Connectivity:** USB 2.0 high speed, 10/100 network solution

R9103	HP LJ 1022	\$379
R9104	HP LJ 1022N	\$549

LASERJET 2430 SERIES



- **Speed:** 33ppm
- **First page out:** 10 seconds

HP LJ 2430T	Rent* \$18.48/wk
Q2891	\$1,649
HP LJ 2430TN	Rent* \$24.18/wk
Q2892	\$2,159
HP LJ 2430DTN	Rent* \$23.67/wk
Q2893	\$2,289

ALL PRINTERS
SUPPLIED WITH
BONUS
PRINTER CABLE



invent

harris technology



Printers

IP PRINTERS

HP COLOR LASERJET MFP 800 SERIES



Network ready Color LaserJet All In One. Print, scan, copy, fax and Digital card-slots
Fast laser printing 19ppm mono and 4ppm colour.
High quality printing with Image Ret2400
1200 dpi resolution scanner

P 2840

3.6 3G Fax

Card slots and fax

Rent* \$16.35/wk

S1223 HP Colour 2820 **\$1,459**

Rent* \$19.60/wk

S1217 Hp Colour 2840 **\$1,749**

HP COLOR LASERJET 600N PRINTER



NEW!

Fast 8ppm colour laser printing
High Quality, Reliable and quiet entry level in line printing
Vibrant quality colour printing with ImageRET2400
Standard 10/100 network printing
Standard 375 page input for versatile printing.
Small true personal desktop design

Rent* \$8.39/wk

S2505 **\$749**

HP COLOR LASERJET 4650 SERIES



- Up to 21ppm colour and black & white
- 160MB RAM
- 600 x 600 dpi with HP ImageREt 3600
- 100 sheet multipurpose tray and 500 sheet input tray
- 533 MHz RISC processor
- 85,000 pages per month

Rent* \$34.78/wk

N5949 HP Color LJ 4650 **\$3,339**

Rent* \$40.71/wk

N6043 HP Color LJ 4650DN **\$3,988**

Rent* \$50.47/wk

N6044 HP Color LJ 4650DTN **\$5,469**

HP COLOR LASERJET 3550 SERIES



- Up to 16ppm colour and black & white
- 600 x 600 dpi with HP ImageREt 3600
- 64MB RAM
- 533 MHz RISC processor
- 45,000 pages per month

Rent* \$19.04/wk

Q3133 HP Color LJ 3550 **\$1,699**

Rent* \$23.03/wk

Q3134 HP Color LJ 3550N **\$2,055**

HP DJ 450 CBI



Compact, high-performance, colour mobile printer for the on-the-go professional

- Up to 9 ppm for black & up to 8ppm for colour
- 1200 dpi black
- USB
- Up to 4800 x 1200 optimised dpi colour
- 4MB ROM/16MB RAM
- USB, IR, Centronics, CF card slot

R8990

\$435

HP BUSINESS INKJET PRINTER 1000



- Quality business printing at and affordable price
- Fast printing with up to 23ppm mono and 18ppm colour
- Quality printing with up to 4800 optimised dpi
- High capacity (1750 pages 5% coverage) individual cartridges
- High 6250 Duty Cycle

S2344

\$269

*RENTSMART

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FAX + MFP + DESIGNJET

HP DESIGNJET LARGE FORMAT PRINTERS

HP DESIGNJET 70
PRINTER

BONUS
512MB IPOD
SHUFFLE*

- Sharp detail and crisp lines and text
- Rich, vibrant colour
- Save valuable time and money
- Full range of media up to A2+/C+

Rent* \$19.94/wk
\$1,779

HP DESIGNJET 130
SERIES

BONUS
512MB IPOD
SHUFFLE*

Image shown 130NR

- HP Viverra Inks for fade-resistant photo quality
- From postcards to 24-inch/A1+ and larger on roll
- Fast printing and up-to-date connectivity

DESIGNJET 130NR

- Automatic roll feed & cutter for 24" wide rolls

Rent* \$29.05/wk

N7837 Designjet 130 **\$2,719**

Rent* \$43.88/wk

N7170 Designjet 130NR **\$4,299**

HP DESIGNJET 90
SERIES

BONUS
512MB IPOD
SHUFFLE*

- Affordable, six-colour, fade-resistant photo quality
- Accurate color consistency from print to print
- From postcards to A2+/C+, and larger on roll
- Fast printing and easy to use

S4474 Roll feed unit **\$350**

Rent* \$24.64/wk

S4243 Designjet 90 **\$2,199**

*RENTSMART

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*Valid for purchases invoiced from 1st July - 31st August 2005. Redemption from HP via claim form available on purchase. Please visit www.hp.com.au/freeprint for your FREE HP Designjet Large Format Print Sample on Designjet page

BROTHER

At our side
brother

BLACK INK CARTRIDGE

For MFC - 620CN (400 page yield)

Q1657 **\$29**

CYAN INK CARTRIDGE

For MFC - 620CN (400 page yield)

Q1659 **\$15**

MAGNETA INK CARTRIDGE

For MFC - 620CN (400 page yield)

Q1660 **\$15**

YELLOW INK CARTRIDGE

For MFC - 620CN (400 page yield)

Q1661 **\$15**

PLEASE NOTE:

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FAX 2820 LASER MACHINE

- Print Technology B/W Laser Technology
- Faxing Capability B/W Faxing
- Fax Modem Speed 14.4K bps Fax Modem
- Best Transmission Speed (sec) Approximately 6 seconds per page
- Maximum Automatic Document Feeder Capacity 20-Page ADF
- Standard Input Paper Capacity (sheets) 250-Sheet Input Capacity
- Standard Memory (MB) 8MB Memory
- Fax Page Memory Up to 500 page fax memory

S1320

\$359



MFC-620CN

- Brother MFC-620CN 8 in 1 Inkjet Flatbed Network MFC with PhotoCapture Centre.
- Colour Printer, 20ppm Mono, 15ppm Colour
- 1200 dpi x 6,000 dpi optimised.
- Up to 100 sheet capacity.

Q1625

\$349

ALL PRINTERS
SUPPLIED WITH
BONUS
PRINTER CABLE



invent

harristechnology



Printers

HP DESKJET & OFFICEJET SERIES

HP PSC 1610



• **Print:** up to 23ppm black, 19ppm colour, up to 4800 x 1200 optimised dpi
• **Scan:** up to 1200 x 1400 dpi
• **Copy:** 600 dpi mono, up to 200 x 4800 dpi colour
• **View, edit and print photos with or without a PC with PictBridge port**
• **Digital media card slots**

HP PSC 2610 ALL-IN-ONE



• **Print:** up to 30/20 ppm, black/colour, up to 4800 optimised dpi
• **Scan:** up to 2400 x 4800 optical resolution, 48-bit colour
• **Copy:** Colour; up to 4800 x 1200 dpi, Black; up to 600 x 1200 dpi
• **Reduce/enlarge:** 25 to 400%

HP OFFICEJET 2710 ALL-IN-ONE



• **Print:** 30ppm black, 20ppm colour, up to 4800 optimised dpi
• **Fax:** 33.6kbps fax modem
• **Scan:** up to 2400 x 4800 optical resolution, 48-bit colour
• **Copy:** up to 30ppm black, 20ppm colour
• **Borderless A4 photo printing**
• **Wired ethernet and wireless 802.11g networking built-in**

HP PSC 1315



• **Print:** up to 17ppm black, 12ppm colour, up to 4800 x 1200 optimised dpi
• **Scan:** up to 600 x 2400 dpi
• **Copy:** 600 dpi mono, up to 1200 x 1200 dpi colour

P7035

\$139

HP DESKJET 4255 ALL-IN-ONE



Ultra compact all-in-one : print, fax, scan, copy and phone in one small machine

• Up to 17ppm in black, up to 1200 x 1200 dpi
• Up to 12ppm in colour, up to 4800 x 1200 optimised dpi colour & 1200-input dpi
• Scan Quality up to 36-bit colour
• Fax Transmission 33.6 Kbps

N8513

\$199

*RENTSMART

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55058

\$185

Q2902

\$359

Q2903

\$459

HP OFFICEJET 5510 ALL-IN-ONE



• **Print:** up to 12ppm black, 10ppm colour
• **Fax:** 33.6kbps fax modem
• **Scan:** 600 x 1200 optical resolution
• **Copy:** 12cpm-black & 8cpm-colour
• **1000 page duty cycle**
• **USB**

HP OFFICEJET 7210 ALL-IN-ONE



• **Print:** up to 30ppm black, 20ppm colour
• **Fax:** 33.6kbps fax modem
• **Scan:** up to 2400 x 4800 optical resolution, 48-bit colour
• **Copy:** 30ppm black, 20ppm colour
• Ethernet
• 50 page ADF
• 8 types of memory card support + PictBridge

Rent* \$6.26/wk

M5279

\$279

R5061

\$559

HP DIGITAL PROJECTORS

VP6315



**BONUS
5 MEGAPIXEL
CAMERA***

FEATURES:

- Smarter versatility and portability with integrated handle
- Simple-to-use. Auto detects optimal setting for data, graphics or video
- 4000 hours lamp life
- 3 year projector warranty
- DLP™ technology, 1600 lumens, SVGA resolution, 2000:1 contrast ratio, 3.5kg for outstanding image quality
- 2 year lamp warranty

Rent* \$22.40/wk

S3311

\$1,999

XP8010



**SPECIAL
PRICE**
(limited time only)

FEATURES:

- DLP™ Technology
- 2600 Lumens in brightness
- True XGA (1024 x 768) resolution
- Perfect for ceiling mounted applications
- High Connectivity
- Warranty: 3 years, return to HP/Dealer

Rent* \$55.36/wk

M0914

\$5,999

*RENTSMART

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VP6325

DIGITAL PROJECTOR

- Smarter versatility and portability with integrated handle
- Simple-to-use. Auto detects optimal setting for data, graphics or video
- 4000 hours lamp life
- 3 year projector warranty
- DLP™ technology, 2000 lumens, XGA resolution, 2500:1 contrast ratio, 3.5kg for outstanding image quality
- 2 year lamp warranty



**BONUS
5 MEGAPIXEL
CAMERA***

Rent* \$33.66/wk

S3312

\$3,199

MP3222

DIGITAL PROJECTOR

Quality solution that provides outstanding price-to-performance

- Featured packed 1.7 kilogram in weight
- 5-segment colour wheel for business and home-theatre use
- 3000 hour lamp life in economy mode
- Carry Bag included
- DLP™ technology, 2000 lumens, XGA resolution, 2000:1 contrast ratio for outstanding image quality



**BONUS
5 MEGAPIXEL
CAMERA***

Rent* \$30.50/wk

P7947

\$2,899

MP3135W

DIGITAL PROJECTOR

Wireless connectivity and present powerpoint slides straight from USB key

- PC-free presenting using storage memory card
- Unique space saving tower design
- 5-segment colour wheel for business and home theatre use
- Rugged and extremely reliable with carry bag included
- DLP™ technology, 1800 lumens, XGA resolution, 2000:1 contrast ratio, 1.7kg for outstanding image quality



**BONUS
5 MEGAPIXEL
CAMERA***

Rent* \$45.92/wk

S3308

\$4,499

*Purchase any MP or VP series projector from Harris Technology in July and redeem HP M417 digital camera (5 Megapixel, 3x optical zoom, 1.8" LCD colour screen) directly from HP. Visit www.hp.com.au/promotions for full details.

ALL PRINTERS
SUPPLIED WITH
BONUS
PRINTER CABLE

Canon
advanced simplicity

harristechnology 

Printers & Media

ADVANCED SIMPLICITY

CANON PIXMA MP760

COLOUR PRINTER/COPIER/SCANNER

colour function: Printer, Copier and Scanner
picolitre FINE (Full-photolithography Inkjet Nozzle
Engineering) print-head technology
Outstanding print quality with up to 4800 x 1200 dpi
ContrastPLUS 5-colour individual ink system for
improved image contrast and cost-savings
Print and copy up to 25 ppm black and 17 ppm colour
Scan photos up to 2400 x 4800 dpi (9600 dpi
unimised)
Built-in Film Adaptor Unit (FAU) allows you to scan up
to 6 negatives or 4 mounted slides
Dual paper path with Auto Sheet Feeder (ASF) and
Front cassette – perfect for easy switching between
plain and photo paper, also enables a huge plain paper
capacity up to 300 sheets and offers space-saving
configuration



7268

\$429

CANON PIXMA IP6000D

BUBBLE JET PRINTER

picolitre FINE (Full-photolithography Inkjet Nozzle
Engineering) Technology
5-colour individual ink tank system with photo cyan &
photo magenta for superb and vivid photos
iConnectBridge and Bubble Jet Direct compatible
Hard & mobile phone direct print
Built-in 2.5" LCD colour viewer
Up to 4800 x 1200 dpi printing resolution
Print speed of up to 11ppm in black and 9ppm in colour
Prints directly onto printable surface CD and DVD
Built-in automatic duplex unit for convenient double
sided printing
Features dual paper path - auto sheet feeder (ASF) &
Front cassette



P9612

\$359

CANON LIDE60 COLOUR FLATBED SCANNER



LIDE60

- 1200 x 2400 dpi optical resolution with 48-bit colour depth for sharp document and photo scans
- USB 2.0 Hi-speed interface for fast data transfer
- Compact and stylish design
- Four one-touch buttons Scan / Copy / PDF / E-mail for easy operation
- Advanced Z-Lid accommodates scanning of bulky items such as books with ease

S4035

\$149

CANON TONER - IP 6000D

CANON BCI-6BK REPLACEMENT BLACK INK

C3420

\$22

CANON BCI-6PC REPLACEMENT PHOTO CYAN INK

C3429

\$22

CANON BCI-6PM REPLACEMENT PHOTO MAGENTA INK

C3430

\$22

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EPSON PRINTERS

EPSON
PERFECTION

NEW

STYLUS PHOTO R2400

New to EPSON's photographic printing family is the STYLUS PHOTO R2400 – the A3+ inkjet printer designed for fine art reproductions, commercial quality photographs and design proof printing. With an array of EPSON-developed technologies including the new UltraChrome K3 Ink set and a 1-inch wide, multi layered piezo print head; unrivalled quality is the only result.

- New EPSON UltraChrome K3 Ink with Matte Black (or Photo Black), Light Black and now Light, Light Black for outstanding greyscale balance
- 5760 Optimised DPI using Epson's Resolution Performance Management (RPM) technology
- One-inch wide Multi-Layered Piezo print head for smooth, detailed and fast prints
- Epson's K3 Inks enable quick drying times and greater colour stabilisation

Rent* \$19.04/wk

S3206

\$1,699

*RENTSMART

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NEW

COLOUR MFP

EPSON RX700

- High Speed printing – up to 20ppm (Black text (Memo) A4)
- Scan directly from 35mm film or slides to digital images
- Bluetooth compatible connection for maximum versatility.
- Individual Intelligent ink cartridge one for each of 6 colours

Rent* \$7.27/wk

S3301

\$649

COLOUR LASER



EPSON AL C3000N

High speed printing at 24 pages-per-minute in both colour and monochrome

- Up to 24ppm in full colour
- Resolution: 600 dpi (2400 dpi with Epson RIT)
- Integrated 10/100 Base TX Network Interface
- Duplexing: Standard
- 600 page input standard

Rent* \$22.40/wk

Q7725

\$1,999

COLOUR LASER



EPSON AL C1100

The Epson AcuLaser C1100 is the affordable colour and monochrome laser printer that delivers high speed, photo quality prints for small businesses and workgroups that require a compact and easy-to-use solution. The AcuLaser C1100 features the latest in EPSON's toner technologies - AcuBrite - and a new Wrap Transfer system to produce outstanding results first time, every time.

Rent* \$8.17/wk

Q7367

\$729

COLOUR LASER



EPSON AL C4100

- Up to 24ppm in full colour
- 2400 dpi with Epson RIT
- Integrated 10/100 Base TX Network Interface
- Integrated Duplex Unit for two-sided printing!
- 600 page input standard

Rent* \$31.55/wk

L5869

\$2,999

PHOTO SCANNER



EPSON PERFECTION 4990

- 4800 x 9600 dpi optical resolution
- High Optical Density
- Windows and Macintosh Drivers
- High Speed - new moving carriage-type TPU, new lamps, faster film scanning (negative film)
- Productive - simultaneous scan of up to 24 35mm strip frames
- The ideal scanner for professional film scanning with DIGITAL ICE dust and scratch removal for film and prints

Rent* \$8.95/wk

R2909

\$799

ALL PRINTERS
SUPPLIED WITH
BONUS
PRINTER CABLE



KONICA MINOLTA

harristechnology



Printers

THE ESSENTIALS OF IMAGING



KONICA MINOLTA pagepro® 1300W

- Up to 16ppm A4
- 1200 x 1200 dpi FineART™
- First page less than 13 seconds
- IEEE 1284 parallel, USB interfaces
- Compatibility: Windows 98SE/ME/2000/XP
- 3 year replacement warranty including drum

049

\$235



KONICA MINOLTA magicolor® 2400W

- 5ppm colour
- 20ppm monochrome
- 2400 x 600 dpi
- Hi-speed USB 2.0 interfaces
- Windows Print System
- 2 year on site warranty

Rent* \$7.72/wk

1208

\$689



KONICA MINOLTA magicolor® 5430DL

- 20ppm colour / 20ppm A4 monochrome
- 64MB RAM (576MB Max)
- 2400 x 600 dpi resolution
- A4, letter, legal page sizes
- Ethernet (10/100BaseTX) & hi-speed USB 2.0 interfaces
- Windows Server 2003/XP/2000/NT4/ME/98, Macintosh OSX v10.2+ compatible & Linux

Rent* \$16.80/wk

1495

\$1,499



KONICA MINOLTA magicolor® 5440DL

- 25ppm colour / 25ppm monochrome
- 64MB RAM (576MB Max)
- 2400 x 600 dpi resolution
- Ethernet (10/100BaseTX) & USB 2.0 (hi-speed) interfaces
- Windows®, Macintosh® & Linux compatible
- Optional Direct Photo Print

Rent* \$22.30/wk

2299

\$1,990



KONICA MINOLTA magicolor® 5450

- 25ppm colour / 25ppm monochrome
- 256MB RAM (1GB Max)
- 9600 x 600 dpi resolution
- Gigabit Ethernet (10/100/1000BaseTX), Parallel & USB 2.0 (hi-speed) interfaces
- Windows®, Macintosh®, Netware & Linux compatible
- PostScript 3, PCL5, PCL6, JPEG/TIFF direct print
- Direct Photo Print

Rent* \$33.34/wk

3256

\$3,169

KONICA MINOLTA magicolor® 2430DL

Connect your digital camera directly to this printer



- Up to 20ppm b&w, 5 ppm colour
- 10/100BaseTX Ethernet® & USB 2.0 (high Speed) interfaces
- 2400 x 600 dpi resolution
- 200-sheets input standard / 700-sheets input maximum
- Direct Photo print
- Windows® & Macintosh® compatible
- 2 year on-site warranty

Rent* \$9.40/wk

R4297

\$839

KONICA MINOLTA magicolor® 2450



- Up to 20ppm b&w, 5 ppm colour
- 10/100BaseTX Ethernet®, Parallel & USB 2.0 (high Speed) interfaces
- 9600 x 600 dpi resolution
- 200-sheets input standard / 700-sheets input maximum
- PostScript 3, PCL5, PCL6
- Direct Photo print
- Windows®, Macintosh® & Linux compatible

Rent* \$12.65/wk

S3254

\$1,129

*RENTSMART

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CHECK OUT LEXMARK'S WEBSITE FOR THEIR LATEST PROMOTIONS

LEXMARK TONER

LEXMARK E SERIES

Lexmark E Series 2,500 page toner cartridge. Suits Lexmark E230, E232, E330 & E323n laser printers.

P2866 **\$115**

LEXMARK X215 3,200 PAGE TONER CARTRIDGE

L5690 **\$105**

LEXMARK C510 SERIES

C510 High Yield Cyan Cartridge

N5852 **\$255**

C510 High Yield Magenta Cartridge

N5853 **\$255**

C510 High Yield Yellow Cartridge

N5854 **\$255**

C510 High Yield Black Cartridge

N5855 **\$179**

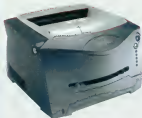
*RENTSMART

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AN EXCELLENT EVERY DAY PRINTER



LEXMARK E232

- Outstanding performance in a desktop laser
- 21ppm A4 mono laser printer
- 200MHz processor and 16MB RAM standard
- PCL6 emulation
- In-built 250-sheet paper drawer
- USB & parallel ports standard
- 2 year onsite exchange LexExpress warranty

ALL IN ONE OFFICE CENTRE



LEXMARK X7170

- 22ppm mono, 15ppm colour
- 4800 x 1200 dpi
- USB 2.0
- 33.6k Colour Fax
- A4 Edge2Edge
- Pict Bridge
- Flat bed CCD scanner
- 50 pg ADF
- 1 year LexExpress warranty

THE AFFORDABLE LASER MULTIFUNCTION SOLUTION



LEXMARK X215

- Printer - 16ppm A4 laser printer & copier
- Copier - including 30-sheet ADF (or flatbed)
- Scanner - colour scan to PC (TWAIN)
- Fax - 33.6Kbps (Super G3) fax modem
- 250 sheet input drawer
- USB & parallel ports standard
- 1 year LexExpress warranty

Q2333

\$399

HIGH QUALITY DESKTOP PRINTER FOR ALL YOUR COLOUR & MONO PRINTING



LEXMARK C510

- 30ppm mono & 8ppm colour laser
- 64MB expandable to 320MB
- 500MHz processor
- 2400 image quality resolution
- PostScript 3 & PCL6 emulation
- 250-sheet input expandable to 780-sheets
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- Put it on your network

N4000e - M2857

\$265

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N2015

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Q6084

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LEXMARK T430D

- 30ppm and first print in 8sec
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- Easily replaceable, high yield toner cartridge
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T430D

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R6350

T430DN

\$1,559

L4391

\$551

SMALL WORKGROUP MFP SOLUTION - FAST & AFFORDABLE!



LEXMARK X422

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- Print, copy, fax and scan in 1 device
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- Colour network scanning
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- Easily replaceable, high yield toner cartridge
- 2 years next business day onsite warranty

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PRINTER CABLE



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Printers

THE VALUE FRONTIER



**Great
Bundle**

MONO LASER PRINTER - FS-920 + CAMERA

- Up to 18ppm A4
- Power PC 405 266MHz
- 600 x 600 dpi
- 32MB (Maximum: 288MB)
- 11 seconds to print first page
- A4, B5, A5, letter, legal paper sizes
- 250 sheet input cassette
- Parallel + USB 2.0
- 15,000 pages per month maximum duty cycle
- Return to base or KyoCare Exchange, 1 year or 100,000 pages whichever occurs first

\$499

KYOCERA FS-1000/FS1010 -
TONER KIT

A4532 **\$135**

KYOCERA FS-3830N TONER
20,000 YIELD

N6559 **\$169**

1345



MONO DUPLEX PRINTER - FS-1020D

- Up to 20ppm A4
- Power PC 405 266MHz
- 600 x 600 dpi
- 16MB RAM (Maximum: 272MB)
- 10 seconds to print first page
- A4, B5, letter, legal paper sizes
- 50 + 250 sheet input
- Parallel + full speed USB 2.0
- 15,000 pages per month maximum duty cycle
- Standard automatic duplex unit
- 2 year return to base warranty

\$545

KYOCERA FS-1920 TK-55
TONER 15,000 PAGE YIELD

N2204 **\$165**

KYOCERA FS-C5016N BLACK
TONER 8000 PAGES

L5849 **\$109**

2191



MONO LASER PRINTER - FS-1920

- Up to 28ppm A4
- Power PC 405 266MHz
- 600 x 600 dpi
- 32MB RAM (Maximum: 288MB)
- 9.5 seconds to print first page
- A4, B5, A5, letter, legal paper sizes
- 100 + 500 sheet input
- Parallel + full speed USB 2.0
- 125,000 pages per month maximum duty cycle
- 2 year on site warranty

Rent* \$11.37/wk

\$1,015

KYOCERA FS-C5016N CYAN
TONER 8000 PAGES

L5850 **\$206**

KYOCERA FS-C5016N
MAGENTA TONER 8000 PAGES

L5851 **\$206**

2002



MONO LASER PRINTER - FS-3830N

- Up to 33ppm A4
- PC 750 CX/300MHz
- 600 x 600 dpi
- 96MB RAM (Maximum: 576MB)
- 11.5 seconds to print first page
- A4, B5, A5, letter, legal paper sizes
- 100 + 500 sheet input
- Fast Ethernet 10/100 Base TX + Parallel + Hi-speed USB 2.0
- 175,000 pages per month maximum duty cycle
- 2 year on site warranty

Rent* \$17.69/wk

\$1,579

KYOCERA FS-C5016N YELLOW
TONER 8000 PAGES

L5852 **\$206**

KYOCERA FS-C5016N COLOUR
KIT WITH BONUS BLACK
TONER

L5853 **\$599**

6150



COLOUR LASER PRINTER - FS-C5016N

- Up to 16ppm A4
- Power PC 750 CXe/400MHz
- 600 x 600 dpi
- 96MB RAM (Maximum: 608MB)
- 16 seconds to print first page
- A4, B5, A5, letter, legal paper sizes
- 100 + 500 Sheet input
- Network + Parallel + Full Speed USB 2.0
- 85,000 pages per month maximum duty cycle
- 2 year on site warranty

Rent* \$29.03/wk

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*RENTSMART

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5843

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F7854 **\$259**

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F7855 **\$259**

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R6902 **\$193**

Yellow Toner Cartridge

R6903 **\$193**
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TONER 3K YIELD**
S4036 **\$127**
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MONO/COLOUR**

- Speed: 25ppm black; 5ppm colour
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R6445

\$679
**FUJI XEROX 3116 MONO
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- 14ppm mono
- 8MB RAM memory
- 15,000 page duty cycle
- 600 x 600 dpi
- 250 sheet input



S0234

\$199
**FUJI XEROX DOCUPRINT C1618
A4 COLOUR LASER PRINTER**

- 16ppm colour / mono
- 64MB RAM memory
- 60,000 page duty cycle
- Single pass laser
- Network ready
- Standard duplex



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F5630

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COLOUR PRINTER**

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- Colour single
- Pass solid ink



Rent* \$29.45/wk

P3268

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C2535A A4 COLOUR LASER**

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Watch HD Quality Digital TV anywhere on your notebook or PC compatible with USB 2.0 BUS powered ports. Supports all Australian/European HDTV and SDTV formats. Real Time Digital Video Recording (DVR) Real HD/SD Time Shifting. Supports DVB-T EPG (Electronic Program Guide) One click HDTV to DVD/MPEG4 Format conversion. Record directly into MPEG-2 (DVD Format).

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Media
Centre 2005
Compatible

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N9808

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N\$4560

FULL **\$450**

*The tech support offer only applies to purchases of the Full and Upgrade version.
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- Pay BAS related liabilities with a single cheque
- Measure the profitability of your business with easy to use tools
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FULL VERSION

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R9291

FULL

\$439

R9464

UPGRADE

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Q5409

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FileMaker® Pro 7 database software is simply the fastest way to effortlessly manage, people, projects, images and information.

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N0476

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N0477

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Buy a Volume Licensing Agreement that includes at least 10 units of FileMaker Pro 7 and you can add a BONUS copy of FileMaker Developer 7. PLUS, you have the option to add one copy of FileMaker Server 7 or one copy of FileMaker Server 7 Advanced at **50% off the normal price!** This offer is valid between 27/03/2005 and 24/09/2005. For further details go to <http://www.filemaker.com.au/promos/vla.html>.

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FileMaker Developer 7 is an enhanced version of FileMaker Pro with integrated developer tools and utilities to help you build better databases faster.

P9697

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N0478

FULL

\$83

P9698

ACADEMIC*

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J6099

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R4121

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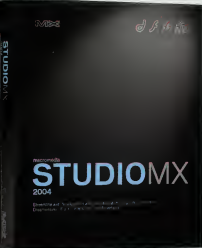
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03 STUDIO MX 2004 INCLUDING FLASH MX 2004

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- AutoCAD (included as part of AutoCAD Mechanical)

R7574

\$265*AutoCAD®
2006AutoCAD LT®
2006AUTODESK®
DWF™ COMPOSER

REVIT SERIES



- Autodesk Revit
- AutoCAD

R0081

\$265*

BUILDING SERIES



- Autodesk Architectural Desktop
- AutoCAD (included as part of Autodesk Architectural Desktop)

R7575

\$265*

Autocad, Autodesk Civil 3D and Autodesk VIZ student versions also available separately.

*Proof of valid student status (of the purchaser) must be provided in order to qualify for this pricing.

PLEASE NOTE:

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AUTOCAD® 2006

AutoCAD® 2006, the 20th release of AutoCAD software, builds upon a tradition of innovation, resulting in true out-of-the-box productivity. Migration is easy, deployment is simple, and intuitive new features make learning a snap. New drafting and annotation tools such as Dynamic Blocks and enhanced hatching eliminate the need for time-consuming workarounds. These new features in conjunction with powerful existing tools like the Set Manager and tool palettes offer a complete set of tools to manage everything from simple to complex projects. AutoCAD 2006 works the way you've always wanted and brings a new level of efficiency and effectiveness to your everyday tasks.

R7542

\$5,995

AUTOCAD LT® 2006

You've spoken and we've listened. The world's number one seller for 2D drafting and detailing, AutoCAD LT® software is better than ever. With AutoCAD LT 2006, hatching is more flexible, dimensioning is improved, and text editing works the way you always wanted it to. Add a more intuitive interface, and the tasks you perform every day are streamlined with just one thing in mind—boosting your productivity. With enhanced editing tools, seamless document sharing, full DWG file format compatibility, and the elimination of tedious workarounds, you've never experienced a more efficient design process.

*UPGRADE FROM LT2002/2004/2006

R7543 FULL

\$1,895

R7544 UPGRADE*

\$695

AUTODESK DWF COMPOSER V2

Accelerate design reviews with Autodesk® DWF™ Composer, the all-in-one way to review, mark up, and revise 2D and 3D designs. View and print and DWF™ files with accuracy and fidelity, then measure and annotate the DWF file before round-tripping the markups for revisions. Cycle time errors, and costs will shrink. Efficiency, however, will soar.

S0481

\$349

AUTOSKETCH® 9

AutoSketch 9 software provides a comprehensive set of CAD tools for creating precision drawings - from electrical details to floor plans, from conceptual sketches to product specifications, and much more.

AutoSketch 9 provides: Comprehensive CAD tools for creating expert quality drawings • Straightforward drafting in a Windows XP - like environment • Tutorials and wizards for a fast start.

P7266

\$149

AUTODESK SYMBOLS 2000

A comprehensive library of Autodesk Symbols covering both Architecture and Engineering services. Simply drag and drop from a toolbar-style graphical interface directly into your AutoCAD drawings.

Autodesk Symbols 2000 Architectural - Contains over 5,600 symbols for building design and documentation.

Autodesk Symbols 2000 Engineering - Contains over 10,800 symbols covering all aspects of Engineering.

A1319 ARCHITECTURAL **\$195**A1320 ENGINEERING **\$195**

COREL

harristechnology



Software

CORELDRAW GRAPHIC SUITE 12 BUNDLE & NEW WORD PERFECT OFFICE 12

Purchase or upgrade to CorelDraw Graphics Suite 12 and receive BONUS Lexmark Z513 Printer, Corel Knockout 2nd and KPT[®] Collection (excludes student and teacher edition)



on CD media only (excludes manuals). Available only while stocks last. Offer excludes student and teacher edition.

***1 FULL VERSION \$645**

***2 UPGRADE/CROSSGRADE \$285**

WORDPERFECT OFFICE 12 - SMALL BUSINESS EDITION



WordPerfect[®] Office 12 - Small Business Edition offers the perfect tools to meet the challenges of operating a small business. Create professional looking documents and presentations. Get versatile spreadsheets with Quattro Pro. Protect your information using antivirus and firewall software. The new WordPerfect Mail makes it easy to stay in touch with co-workers, clients and partners. Invest time and money back into your business with WordPerfect OfficeReady solution packs. Corel Paint Shop[™] Pro[®] 9 allows limitless creativity with professional-strength photo editing.

\$1951 \$499

PAINT SHOP PRO 9



Photos: Edit, enhance, and repair with precision tools. Create masterpieces with realistic painting tools. Features: Design for presentations, print, or the Web. Creativity has no limits, neither should your software. Paint Shop Pro continues to set the standard for reliable, professional image editing. Version 9 builds on Paint Shop Pro's legacy of creative innovation with a suite of art media features, professional photo editing and precision graphic design capabilities. Digital Camera Noise Removal Filter scans photos and removes image noise while intelligently preserving the textures. Automatic Aberration Removal Filter eliminates the white fringe that often appears in digital photographs. Flash Filter corrects the underexposure of shadows. Backlighting Filter compensates for overexposed areas.

***4 FULL \$275**

***4 UPGRADE \$170**

COREL PAINTER[™] IX



Corel[®] Painter[™] IX - the world's most powerful Natural-Media[®] painting and illustration software - features unique digital brushes, art materials and textures that mirror the look and feel of their traditional counterparts. The newest version of Corel Painter takes digital design to unprecedented levels with the revolutionary Artists' Oils Painting System, Snap-to-Path Painting, Quick Clone for photographers, and brushes that perform up to ten times faster than previous versions. Corel Painter enables some of the world's most accomplished creative professionals - including commercial designers, artists, and photographers - to extend their natural talents and techniques to create original works of breathtaking digital art.

Q0500 FULL \$629

Q0501 UPGRADE/CROSSGRADE \$349

WORD PERFECT[®] OFFICE 12 - HOME EDITION



- WordPerfect 12 - is the legendary word processing for creating resumes, letters, greeting cards, labels school reports and more.
- Quattro Pro 12, the renowned spreadsheet application that helps manage family finances, coordinate hectic schedules. In addition, more than 50 templates included in the WordPerfect OfficeReady Personal Finance Solution Pack will help you plan a successful course towards future financial security.
- Encyclopaedia Britannica Ready Reference 2005 provides fascinating answers to everyday questions.
- Corel Photobook and Corel PhotoAlbum
- Pinnacle Instant CD/DVD v8LE
- Norton Internet Security 2005 suite

Q3700 \$135

PAINT SHOP ALBUM 5



- Find photos in the blink of an eye
- Improve photos in an instant
- Have fun sharing photos
- Protect photos from computer crashes and viruses
- Includes Bonus PhotoRecovery Software, scrapbook templates, photo paper samples, and more.

R2118 \$85

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SMALL BUSINESS SOLUTIONS

pcANYWHERE V11.5

**\$70^A****UPGRADE****REBATE****NOW SUPPORTS
LINUX**

Symantec pcAnywhere™, with powerful file transfer, robust security, strong remote management tools, and a new suite of features for increased accessibility, performance, and security that make it easy for helpdesk and IT personnel to resolve server and workstation problems.

V11.5 HOST AND REMOTE

R6063

\$259

V11.5 HOST ONLY

(INCL.1 REMOTE) 5 PACK

Q6650

\$539

pcANYWHERE V11.5 UPGRADE REBATE OFFER

^ATERMS & CONDITIONS:

Valid on purchases of new pcAnywhere product before 31/12/05. Rebate requests must be received by 14/01/06.

For previous customers only.

Coupon in box, items via redemption. Customer rebate requests will be sent to and fulfilled by Symantec Australia.

For full terms & conditions please

see: www.symantec.com.au/region/au_nz/promo/

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AREAS OF PROTECTION

Symantec
AntiVirus™ 10.0Symantec
AntiVirus™ 10.0
with Groupware
ProtectionSymantec™
Client Security
3.0Symantec
Client Security
3.0 with
Groupware
Protection

DESKTOP/REMOTE PC

REMOVES VIRUSES, WORMS,
AND TROJAN HORSES
AUTOMATICALLY

DETECTS CERTAIN NON-VIRUS
THREATS SUCH AS SPYWARE

STOPS WORMS FROM
SPREADING THROUGH EMAIL

PROTECTS COMPUTERS FROM
HACKERS WITH A DESKTOP
FIREWALL

BLOCKS INTERNET ATTACKS
WITH INTRUSION DETECTION

NETWORK SERVER

REMOVES VIRUSES, WORMS,
AND TROJAN HORSES
AUTOMATICALLY

DETECTS CERTAIN NON-VIRUS
THREATS SUCH AS SPYWARE

INCLUDES A CENTRALISED
CONSOLE TO INSTALL, UPDATE,
AND RESPOND

MICROSOFT EXCHANGE/
LOTUS DOMINO SERVERS

REMOVES VIRUSES, WORMS
AND TROJAN HORSES IN EMAIL

FILTERS SPAM AND UNWANTED
EMAIL CONTENT

PART	\$5492	\$5501	\$5515	\$5518
5 USER	\$425	\$599	\$549	\$785
PART	\$5498	\$5508	\$5516	\$5519
10 USER	\$789	\$1,099	\$999	\$1,425
PART	\$5500	\$5514	\$5517	\$5520
25 USER	\$1,755	\$2,399	\$2,269	\$3,155

5 VERSIONS

Internet Security



INTERNET SECURITY BUNDLE

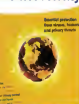
TOTAL ONLINE PROTECTION COMBINED WITH PASSWORD CONVENIENCE
Symantec's Norton Internet Security 2005 provides essential protection from viruses, hackers, and privacy threats.

Microsoft's Fingerprint Reader (HT Part: P7044) lets you logon to your home PC and access favourite web sites with a touch of a finger!

R7588 BUNDLE PRICE

\$135

Internet Security



NORTON INTERNET SECURITY™ 2005**

Symantec's Norton Internet Security™ 2005 provides essential protection from viruses, hackers, and privacy threats. Norton AntiVirus™ is the world's most trusted antivirus solution*. Norton™ Personal Firewall keeps personal data in and hackers out. And Norton™ Privacy Control, Norton AntiSpam™, and Norton™ Parental Control safeguard you and your family from other common online risks.

Q0503 SINGLE USER

\$99

Q0504 3 USER

\$185

R1942 5 USER

\$279

SystemWorks Personal Firewall



GREAT VALUE BUNDLE!

Symantec Norton SystemWorks™ 2005 Premier gives you powerful tools to solve PC problems and protect data. This easy-to-use suite helps you eliminate viruses, back up your files, and prevent computer problems. A new recovery disk allows you to recover data even when Windows won't start up. Includes full version of Norton Ghost 9.0, is developed with Drive Image™ Technology - this new technology allows users to take advantage of key features such as hot imaging, incremental backups, automatic backups and creating drive letters for images.

R0242 BUNDLE PRICE

\$159

SystemWorks Personal Firewall



GREAT VALUE BUNDLE!

Symantec Norton SystemWorks™ 2005 is the smartest way to solve computer problems and protect your valuable data. This easy-to-use software helps you eliminate viruses, prevent computer problems, and restore your system to a healthy state. The improved One Button Checkup makes it easier than ever to find and fix computer problems.

R0231 BUNDLE PRICE

\$129

AntiVirus



NORTON ANTIVIRUS 2005

Symantec's Norton AntiVirus™ 2005 is the world's most trusted antivirus solution.* It removes viruses, worms, and Trojan horses automatically - without interrupting your work. New Norton™ Internet Worm Protection blocks certain more sophisticated worms (such as Blaster and Sasser) before they enter your computer. Norton AntiVirus can also detect spyware and other non-virus threats.

R0208 SINGLE USER

\$79

R2137 3 USER

\$119

R3746 5 USER

\$180

* Top-selling antivirus software product from December 2000 through March 2004 based on The NPD Group's retail Top Selling Business Software list.

NORTON INTERNET SECURITY 2005 AntiSpyware Edition



NEW
Anti Spyware
Edition. Stops
viruses, hackers
& spyware

Symantec's Norton Internet Security™ 2005 AntiSpyware Edition provides essential protection from viruses, hackers, and privacy threats. This edition includes powerful new Norton™ Spyware Protection, which automatically detects and removes both spyware and adware. The all-in-one protection of Norton Internet Security also helps prevent email fraud and keep confidential information safe.

FEATURES INCLUDE:

- Norton AntiVirus™
- Norton™ Spyware Protection
- Norton™ Personal Firewall
- Norton™ Privacy Control
- Norton AntiSpam™
- Norton™ Parental Control

S5481

\$119

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MIND YOUR OWN BUSINESS. SMARTER.

MYOB
RETAILMANAGER 8

The complete retail picture. MYOB RetailManager is the perfect fit for businesses who require

comprehensive stock management, detailed reporting and more.

With MYOB RetailManager it is easy to keep track of every transaction in your store from sales, stock movements, GST and gross profit, right through to staff performance and even customer details.

S1237 FULL

\$1,650

MYOB RETAILREADY



MYOB RetailReady includes:

- MYOB RetailBasics POS software
- Posiflex Thermal Printer PP7000^A
- Posiflex Scanner CD2860^A
- Posiflex Cash Drawer CR3100^A

RetailBasics enables you to:

- Search for stock and maintain stock items
- Analyse what's selling, what's not and GST collected
- Manage Lay-bys and process refunds

R5316

\$789

MYOB RETAIL READY
HARDWARE VIA REDEMPTION

^AThe Posiflex Thermal Printer PP7000, Scanner CD2860 and Cash Drawer CR3100 are available via redemption from MYOB. (Colour of Posiflex hardware may vary due to availability) Product must be registered to redeem. Redemption form from inside the box must be completed and accompanied by proof of purchase. Standard postage of \$50 applies to send in your redemption to MYOB

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MYOB ACCOUNTING PLUS V15



BONUS*
Uniden
Cordless
Phone
+ Headset



MYOB Accounting Plus comes with an award winning integrated payroll, is the ideal single-user business management and is a great accounting solution for smaller employers. MYOB Accounting Plus also makes it easy to track and charge for your time, and provides access to powerful profit-building information about your business.

R9227 FULL*

\$469

R9442 UPGRADE

\$259

MYOB ACCOUNTING V15



BONUS*
Uniden
Cordless
phone



MYOB Accounting is for businesses that need to streamline accounts procedures and would benefit from improved inventory management, better management of customer and supplier relationships and advanced business reporting.

R9042 FULL*

\$249

R9441 UPGRADE

\$239

MYOB PREMIER V9



BONUS*
Uniden Cordless
Phone + Microsoft
Wireless Optical
Desktop 3



MYOB Premier is for businesses that need to streamline accounts procedures, whether through simplifying complex inventory issues, running an automated payroll billing, accessing advanced reporting or increasing productivity with multi-user access. This product comes with 12 months software support and upgrades.

R9228 FULL*

\$1,289

MYOB BUSINESS BASICS



With MYOB BusinessBasics you'll save lots of time and effort as it keeps your banking, sales and contact information in one easy to use system.

Issue professional-looking tax invoices, track all money coming in and out, and keep a detailed history of your business transactions. All your information is organised and easy to access so you can spend more time on your business, not on the books.

G4153

\$899

*VIA REDEMPTION

For purchases between 1st June 2005 to 31 July 2005, MYOB will be offering a Uniden Cordless Phone bundle redemption with the purchase of a FULL version of either MYOB business programs of MYOB Accounting, MYOB Accounting Plus / MYOB AccountEdge and MYOB Premier (Upgrades or OEM versions not included in this promotion). Redemption details available from website displayed on box.



MICROSOFT WINDOWS XP WITH SERVICE PACK 2

WINDOWS XP SERVICE PACK 2 WITH ADVANCED SECURITY TECHNOLOGIES

Service Packs offer convenient, all-in-one access to the most up-to-date drivers, tools, security enhancements, and other critical updates. The latest service pack for Windows XP - Service Pack 2 (SP2) - is all about security improvements, and it's one of the most important service packs ever released.

SERVICE PACK 2 BENEFITS INCLUDE:

More control with Windows Security Centre - here you can check your Windows Firewall, AV Software and Windows Security updates easily in location.

Protect your PC with the NEW Windows Firewall - A Firewall helps you to guard against unwanted attacks on your PC when you are connected to the internet.

Block distracting pop-ups in Microsoft Internet Explorer - now you have the option to reduce unwanted advertising and content and stop wasted bandwidth by blocking unwanted advertising pop-ups.

Attachment Manager - helps protect against viruses that can spread through E-Mail, Windows Messenger and Internet Explorer by identifying potentially unsafe attachments.

Bluetooth Hardware Support - Bluetooth is the latest in Wireless technology that enables you to link your PC with latest Bluetooth-enabled wireless devices, including keyboards, mice, printers and mobile phones.

WINDOWS XP HOME -

WITH SERVICE PACK 2 INCLUDED



most dependable Windows operating system

Windows XP sets the standard in efficient computing with a new visual design, the reliable Windows engine, and Internet security features.

Handle digital media like a pro

Transferring footage to your computer is faster and easier than ever, with everything you need to take, edit, and share your home movies.

Always connected

Windows XP has built-in Internet, home networking, real-time voice, video, and instant messaging support. Publish pictures to a Web site or shop online.

Remote Assistance to solve problems

Get a friend or support professional to connect to your PC over the Internet to fix a problem or answer a question.

WINDOWS XP PROFESSIONAL -

WITH SERVICE PACK 2 INCLUDED



• Added features

The Professional Edition adds security and privacy, advanced recovery options, improved network connections, and more to the features of Home Edition.

• Superior mobile support

Work offline or access your computer remotely with ease with wireless networking support, configuration wizards, improved power management, and more.

• Greater security

Encrypt your files and folders with the highest levels of protection from hackers and data theft, and connect to Virtual Private Networks securely.

• Integrated and current

Integrate with Windows Servers and management solutions and keep your system current with automatic Windows Update.

052 FULL \$295

055 UPGRADE \$150

Q0447 FULL

\$425

Q0458 UPGRADE

\$305

Q0459 UPGRADE - ACADEMIC®

\$120

FOR CURRENT USERS OF WINDOWS XP

If you already own Windows XP, it is strongly recommended by Microsoft to download and install Service Pack 2 (SP2). To do so you can download SP2 or arrange to have it shipped on CDROM.

BROADBAND USERS

Broadband users can download Microsoft Windows XP SP2 (100MB stand alone version). Microsoft has provided SP2 for free download at www.microsoft.com/australia/windows/sp2

DIAL-UP USERS

Due to the large file size of the Service Pack, we don't recommend you download it if you are on a dial-up connection. Dial-up users can instead order a Windows XP SP2 CD online.

www.microsoft.com/australia/windows/sp2

ORDERING

If you would rather have Windows XP SP2 delivered to you, see this web address www.microsoft.com/australia/windows/sp2 to order a CD version of SP2 by mail*

*Shipping and handling costs may apply

WINDOWS XP SP2 - SYSTEM REQUIREMENTS

To install Windows XP SP 2 via CD, you need:

- A PC with Windows XP Home Edition, Professional, Media Center Edition or Tablet PC Edition installed
- 233MHz or higher processor
- 64MB of RAM or higher
- 1.6GB of available hard disk space during installation
- CD-ROM drive

*For non commercial use. Must be a Qualified Education User. For eligibility criteria visit: <http://www.microsoft.com/australia/education/howtobuy/meud/studentsandteachers.aspx>

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MICROSOFT HAVE TAKEN A BITE OUT OF THE PRICE

MICROSOFT OFFICE HAS EVOLVED[^]. HAVE YOU?



microsoft.com.au/office

[^]Comparison is between Microsoft Office 2003 released in October 2004 and prior versions of Microsoft Office.

^{*}Special pricing from microsoft available between 27th May 2005 and 31st July 2005 and applies to Microsoft: Office 2003 Student and Teacher Edition, Office 2003 Professional Academic Edition and Office Small Business Edition Upgrade. ©2005 Microsoft Corporation. All rights reserved. Microsoft and the Office logo are either registered trademarks of Microsoft corporation in the united states and/or other countries.



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MICROSOFT PROFESSIONAL EDITION 2003 ACADEMIC

Microsoft Office Professional Edition 2003 can help you and your organisation communicate information with immediacy and impact. New and familiar programs and improved functionality help you build powerful connections between people, information, and business processes.

**HOT
PRICE***

L0803 ACADEMIC*

\$19



OFFICE SMALL BUSINESS 2003 UPGRADE

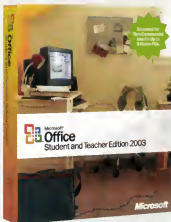
Microsoft Office Small Business Edition 2003 is a personal and business productivity solution that enables small-business employees to:

- More effectively manage customers and sales opportunities
- Create impressive sales and marketing materials
- Manage e-mail and share information efficiently and securely

**HOT
PRICE***

L0827 UPGRADE

\$31



OFFICE STUDENT & TEACHER EDITION 2003

Microsoft Office Student & Teacher Edition 2003 enables you to complete your document-related tasks easily, and allows you and your family to enjoy the familiarity and skills that will keep each of you ahead of the curve at school and at work.

Offered at the best prices for home users – Office 2003 Student & Teacher Edition includes full versions of Office products (Word, Excel, PowerPoint and Outlook 2003).

**HOT
PRICE***

L0802 ACADEMIC*

\$10

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CROSOFT OFFICE APPLICATIONS

VISIO STANDARD 2003

Visio Standard 2003 enables users to visualise, document, communicate, and share ideas with attention-grabbing flowcharts, organisation charts, office layouts, and more.

L1540 FULL **\$299**

L1542 UPGRADE **\$155**

L1546 ACADEMIC* **\$99**

VISIO PROFESSIONAL 2003

Visio Professional 2003 gives IT professionals, engineers, and developers comprehensive technical diagramming and drawing tools to create and share information.

L1543 FULL **\$739**

L1544 UPGRADE **\$375**

L1547 ACADEMIC* **\$215**

MICROSOFT FRONTPAGE 2003

Microsoft® Office FrontPage® 2003 is the Web site creation and management tool that gives you the features, flexibility and functionality to help you build better Web sites. FrontPage delivers the professional design, authoring, data, and publishing tools customers have asked for to create dynamic and sophisticated web sites.

L0812 FULL **\$325**

L0813 UPGRADE **\$170**

L0814 ACADEMIC* **\$150**

MICROSOFT PUBLISHER 2003

Comprehensive solution for creating and publishing a wide variety of publications for desktop printing, commercial printing, e-mail distribution, or viewing on the Web. Start from professionally designed templates that you can customise with color schemes, font schemes, various layout options, and your own design sense.

L0820 FULL **\$275**

L0821 UPGRADE **\$159**

L0822 ACADEMIC* **\$145**

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MICROSOFT® ONE-NOTE™ 2003



Microsoft Office OneNote 2003, is the Microsoft Office System note-taking and management program that enables you to capture, organise, and reuse your notes on laptop computers, desktop computers, or Tablet PCs.

FULL

L0906

\$149

ACADEMIC*

L0907

\$79

MICROSOFT® PROJECT STANDARD 2003



Project Standard 2003 is designed to improve your ability to organise work and communicate effectively and succinctly through familiar, easy-to-use tools.

FULL

L3553

\$929

ACADEMIC*

L3231

\$119

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AirPlus XTREME G
108Mbps BUNDLE



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BUNDLE**

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Building Networks for People

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S1284/S1285

D-Link DI-624 Wireless G Router

Up to 108Mbps, advanced firewall & parental control. 802.11g, 802.11b compatible, Increased Security with 802.1X and WPA.



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D-Link DWL-G520
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802.11g 108Mbps
Wireless PCI Adapter

OR

FOR NOTEBOOKS
DI-624 + DWL-G650

D-Link DWL-G650
Wireless 2.4Ghz
CardBus Adapter
Up to 108Mbps and fully
compatible with 802.11b

BUSINESS CENTRE LOCATIONS

NSW

NORTH RYDE

45 Epping Road
North Ryde NSW 2113

NORTH SYDNEY

Ground Floor Bayer Building
275 Alfred Street North
North Sydney NSW 2060

PARRAMATTA

46 George Street
Parramatta NSW 2150

ALEXANDRIA

Unit 1, 110 Botany Road
Alexandria NSW 2015

VIC

HAWTHORN EAST

612 Burwood Road
Hawthorn East VIC 3123

ACT

FYSHWICK

29-31 Townsville Street
Fyshwick ACT 2609

QLD

FORTITUDE VALLEY

356 St Pauls Terrace
Fortitude Valley QLD 4006

WA

OSBORNE PARK

426 Scarborough Beach Rd
Osborne Park WA 6017

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It's not just because great music, movies and games deserve great sound... It's because you do.



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Rich, high fidelity 24-bit audio, 256 times the clarity of your basic notebook.



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Enjoy 7.1 cinematic surround sound with built-in Dolby® Digital EX and DTS-ES™ decoding.



Experience ultra-realistic gaming audio with blistering framerate.



Record music and audio samples in richer, cleaner and professional 24-bit audio quality.

PC Games Addict - April 2005

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Digital Wireless Headphones with Bluetooth® Technology
High quality full digital transmission for up to 10m radius in range



Headphones HQ-1700
Reversible earcups with Neodymium magnet drivers



Creative Travelsound® Notebook 500
30 hours playback on 4 x AAA batteries



I-Trigue® 2200 Portable Speakers
High precision 36mm NeoTritium micro-drivers



I-Trigue® 3400 2.1 Speakers
Satellites with advanced NeoTritium 36-Array technology



I-Trigue® 5600 Surround Speakers
Satellites with revolutionary Acoustic Loaded Module™ (ALM™)

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EPSON756R

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To get the very best printing results you need all the right elements working together. The EPSON PerfectPicture Imaging System™ combines the highest quality photo printers, genuine EPSON inks and papers to give outstanding results every time. With quality like this, it's little wonder three times as many professional photographers choose EPSON when photo printing*. Call 1300 361 054 or visit us at www.epson.com.au

*Source Colmar Brunton Research (Aust) 2004.